MU-R201

SERVICE MANUAL

US Model
Canadian Model
AEP Model
E Model

SPECIFICATIONS

Quantization	16-bit linear
Sampling frequency	26 kHz
Inputs	
Input type	Standard phone jacks (2 channels) RCA-type phono jacks (2 channels)
Standard input level	−20 dBs/+4 dBs
Input impedance	more than 10 kilohms
Outputs	
Output type	Standard phone jacks (2 channels) RCA-type phono jacks (2 channels)
Standard output level	−20 dBs/+4 dBs
Output impedance	less than 600 ohms
Frequency response	
DIRECT	20 Hz−20 kHz ±1.0 dB
EFFECT	20 Hz−11 kHz ±1.5 dB (EQ flat)
Dynamic range	better than 90 dB (EQ flat)
THD	below 0.008%, 1 kHz, maximum delay output
Memory capacity	Preset memory 100 User memory 100
Power requirements	USA: 120 V AC, 60Hz Europe: 220 V or 240V AC, 50/60 Hz
Power consumption	28 W
Dimensions	approx. 482 × 44 × 320 mm (w/h/d) (19 × $1^{3}/_{4}$ × $12^{5}/_{8}$ inches) including projecting parts and controls
Weight	approx. 4.5 kg net. (9 lb 15 oz)

MICROFILM

DIGITAL REVERBERATOR

SONY®

AUD

FEATURES

Impressive Stereo Ambience
All circuits from the input to the output stage are equipped for stereo processing. The key device of the MU-R201 is a newly developed 2-channel audio processing LSI (Digital Presence Synthesizer CXD1079), which creates stereo effects not possible with two monophonic reverberators. The result is striking, high-quality reverberation.

Versatile Preset Characteristics
Musicians, recording engineers and sound technicians from all over the world have contributed to select a total of 100 presets which are stored in the memory of the MU-R201. The user can immediately choose a setting for any application.

Creative Effect Shaping
The EDIT and EQ (equalizing) functions can be used to change preset reverberation effects and to produce original settings. Besides the 100 factory-preset characteristics, a user memory for another 100 settings is provided, offering unlimited creative potential.

Wide Variety of Reverberation Types
10 basic modes serve as a reference, complemented by many versatile effects, such as hall ambience, acoustically "live" room effects, tightly controlled plate reverberation, percussive multi-gate reverb and multi-reverse reverb. The dual multi delay setting offers up to 20 repeat outputs for each channel separately, and reverb & gate effects further enhance versatility.

Direct Memory Selection
Memory selection and adjustment is simple and straightforward, for easy operation also during a live performance.

Serves as Two Independent Reverberator Units
In modes 3 (Multi Gate Reverb), 4 (Multi Reverse Reverb), 5 (Dual Multi Delay), 7 (Dual Reverb), 8 (Reverb & Gate), and 9 (Reverb & Delay), the two channels of the MU-R201 operate separately. This permits use, for example, with two different instruments during recording or a live performance.

Precise Sound Definition
Up to 26 parameters can be set, to design exactly the sound field you want and to create special effects not available in ordinary surroundings.

4-band Equalizer Control
The MU-R201 incorporates a programmable two-channel four-band equalizer (LOW, L-MID, H-MID, HIGH). Equalizer data can be stored along with effect settings, to instantly provide the desired sound shaping characteristics for each application.

Remote Control Capability
An optional remote control unit (available soon) permits operation of the unit from any convenient location. A foot switch (FS-11) can be used to increase or decrease memory numbers, switch effect processing off and on, and suspend effects.

Flexible Input/Output Configuration
Two sets of input/output jacks are provided, to accommodate either standard phone plugs or RCA-type phono plugs. A +4/ – 20 dB LEVEL selector matches the unit to professional or consumer equipment and any musical instrument.

Easy Combination with Digital Instruments
The integrated MIDI interface accepts program change signals for external selection of memory numbers during a performance. The effect level can also be controlled via the key-touch and control change signals, making the MU-R201 ideally suited for use as an effecter for digital instruments.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT
À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE TRAME ET UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

SAFETY CHECK-OUT (US Model)

After correcting the original service problem, perform the following safety check before releasing the set to the customer:
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2 V AC range are suitable. (See Fig. A)

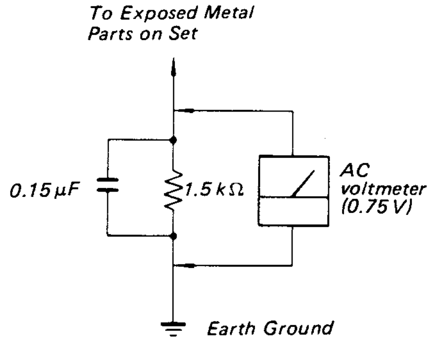


Fig. A. Using an AC voltmeter to check AC leakage.

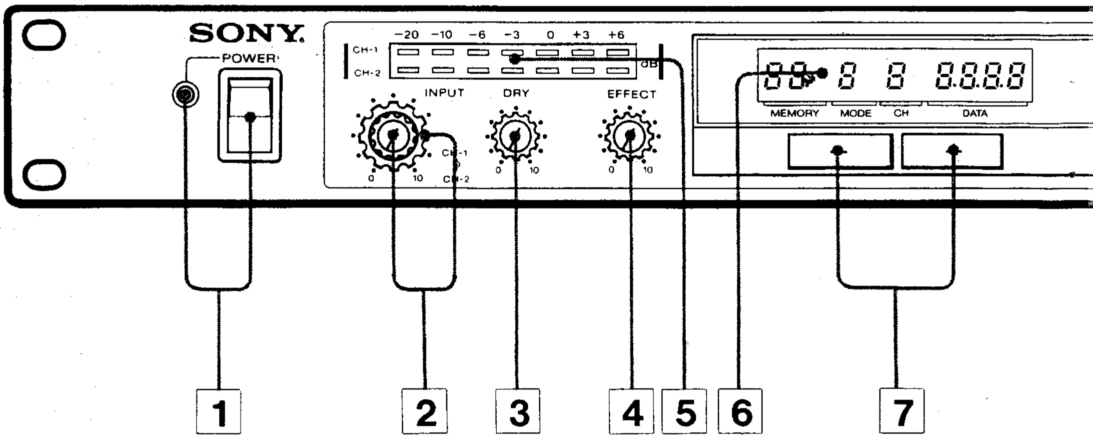
TABLE OF CONTENTS

Section	*Title*	*Page*
SECTION 1	**OUTLINE**	4
1-1.	Location and Function of Parts and Controls	4
1-2.	Connections	7
1-3.	Activating a Preset Effect	8
1-4.	Table of Preset Effects	10
1-5.	The Concept of a Reverberator	11
1-6.	On Parameters	12
1-7.	Operating Modes	13
1-8.	Recalling Memory Settings (Memory Function)	22
1-9.	Editing Effects (Edit Function)	23
1-10.	Changing Effects (EQ Function)	25
1-11.	Storing Data (Write Function)	27
1-12.	Using Midi Control (Midi Function)	29
1-13.	Connection Examples	31
1-14.	Preset Memory Data Chart Memory Numbers 00—19	35
1-15.	Midi Implementation Chart	45
1-16.	Block Diagram	47
SECTION 2	**ELECTRICAL ADJUSTMENT**	50
SECTION 3	**DIAGRAMS**	51
3-1.	Mounting Diagram	51
3-2.	Schematic Diagram —Audio Section—	55
3-3.	Schematic Diagram —System Control Section—	59
SECTION 4	**EXPLODED VIEWS AND PARTS LIST**	64
SECTION 5	**ELECTRICAL PARTS LIST**	66

SECTION 1
OUTLINE

1-1. LOCATION AND FUNCTION OF PARTS AND CONTROLS

FRONT PANEL


SONY
POWER
-20 -10 -6 -3 0 +3 +6
CH-1
CH-2
dB
INPUT
DRY
EFFECT
CH-1
CH-2
0 10
0 10
0 10
MEMORY
MODE
CH
DATA
1
2
3
4
5
6
7

1 POWER switch and indicator
When the unit is switched on, the indicator lights up and the settings chosen during the last session are automatically recalled. A muting circuit is active for a few seconds after switch-on.

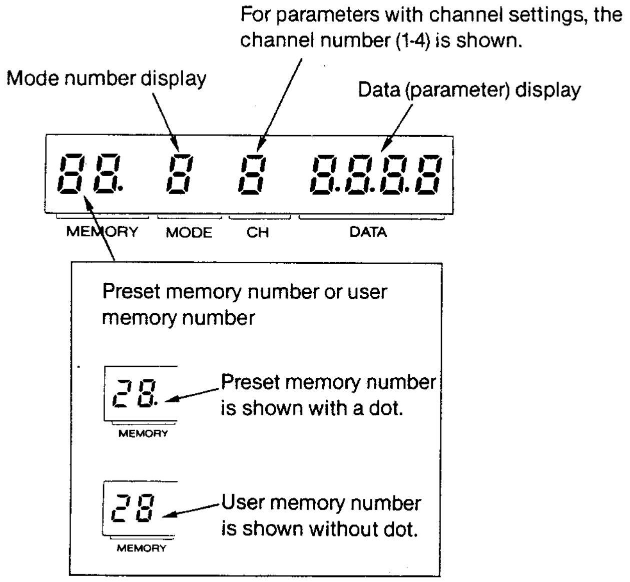
2 INPUT level control
This dual concentric control adjusts the input level for each channel separately. The outer control operates on channel 1 and the inner control on channel 2.

3 DRY level control
This control adjusts the amount of the unprocessed source signal in the output. In conjunction with the EFFECT control 4, this setting determines the reverberation ratio. When the effect signal only is desired, this control should be set to "0".

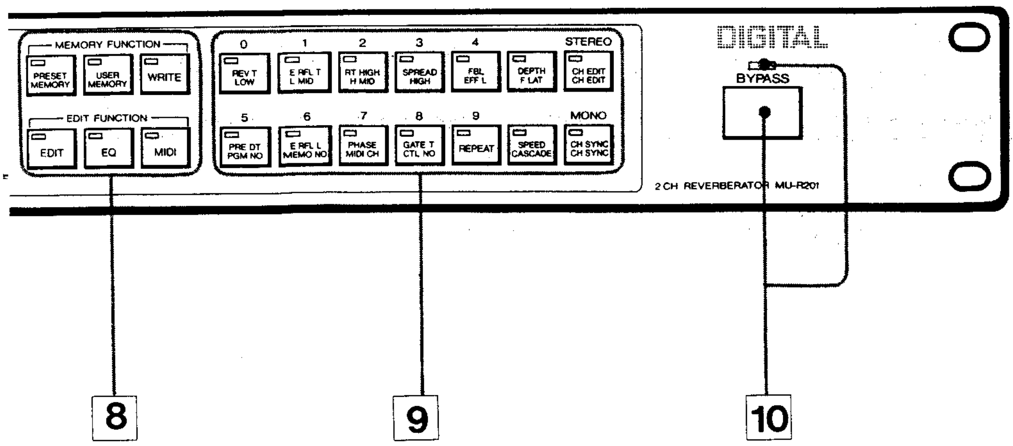
4 EFFECT level control
This control adjusts the amount of the processed effect signal in the output. In conjunction with the DRY control 3, this setting determines the reverberation ratio.

5 Input level meter
These indicators show the input level for each channel separately. Adjust the INPUT control 2 so that the 0 dB or +3 dB indicators light up on signal peaks.

6 Display
Information necessary for operation of the unit, such as memory number, mode number, channel number and parameter values is shown here.


For parameters with channel settings, the channel number (1-4) is shown.
Mode number display
Data (parameter) display
MEMORY
MODE
CH
DATA
Preset memory number or user memory number
28.
Preset memory number is shown with a dot.
MEMORY
28
User memory number is shown without dot.
MEMORY

7 +/– keys
These buttons are used to change parameter values or the first digit of memory numbers. + increases the number and – decreases it. When a button is kept depressed for more than 2 seconds, the indication changes continuously at a high speed.

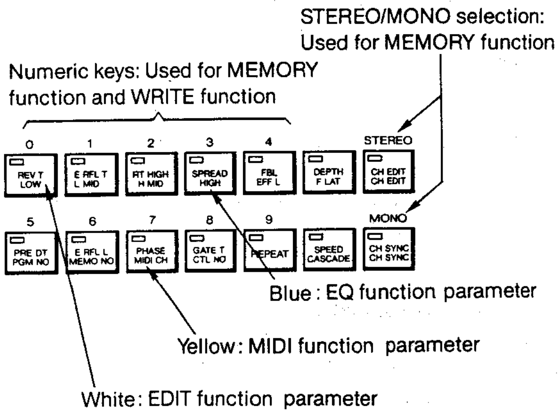

MEMORY FUNCTION
PRESET MEMORY
USER MEMORY
WRITE
EDIT FUNCTION
EDIT
EQ
MIDI
0
1
2
3
4
STEREO
REV T LOW
E RFL T L MID
RT HIGH H MID
SPREAD HIGH
FBL EFF L
DEPTH F LAT
CH EDIT CH EDIT
5
6
7
8
9
MONO
PRE DT PGM NO
E RFL L MEMO NO
PHASE MIDI CH
GATE T CTL NO
REPEAT
SPEED CASCADE
CH SYNC CH SYNC
DIGITAL
BYPASS
2 CH REVERBERATOR MU-R201
8
9
10

8 **Function buttons**
The following six functions can be activated with these buttons.

- **PRESET MEMORY function**
  Used to recall a preset memory from "00." to "99.".
- **USER MEMORY function**
  Used to recall a user memory from "00." to "99.".
- **EDIT function**
  Used to change effect parameters.
- **EQ function**
  Used to adjust the two-channel four-band equalizer and to change the effect level parameter. This button is also used for the cascade connection in mode 8 and mode 9.
- **WRITE function**
  Used to store an edited effect in the user memory or transfer memory data to another number.
- **MIDI function**
  Used to program the unit for control through external MIDI equipment.

9 **PARAMETER buttons**
The action of these buttons depends on which function is selected. The indication above the buttons denotes their action for the MEMORY function and the WRITE function (numeric keys and STEREO/MONO switching).
The indication on the button face is color coded as follows.

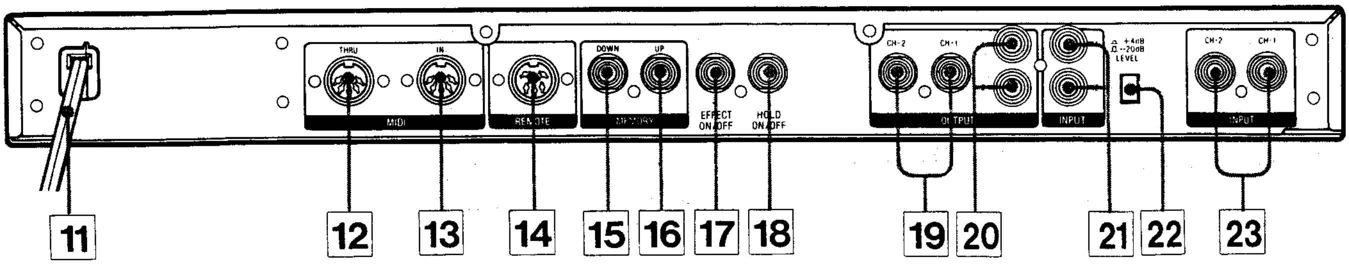
White: EDIT function
Blue: EQ function
Yellow: MIDI function


STEREO/MONO selection: Used for MEMORY function
Numeric keys: Used for MEMORY function and WRITE function
0
1
2
3
4
STEREO
REV T LOW
E RFL T L MID
RT HIGH H MID
SPREAD HIGH
FBL EFF L
DEPTH F LAT
CH EDIT CH EDIT
5
6
7
8
9
MONO
PRE DT PGM NO
E RFL L MEMO NO
PHASE MIDI CH
GATE T CTL NO
REPEAT
SPEED CASCADE
CH SYNC CH SYNC
Blue : EQ function parameter
Yellow: MIDI function parameter
White: EDIT function parameter

When the EDIT, EQ, or MIDI function is selected, the indicators of buttons which control adjustable parameters for this function are flashing.

10 **BYPASS switch and indicator**
Press this switch to bypass the signal processing circuits completely and send the signal directly to the outputs (indicator lights up).
While the power is turned off, the processing circuits are automatically bypassed (but indicator does not light).

REAR PANEL



11 **Power cord**

12 **MIDI THRU (MIDI through out) connector** (DIN 5P)
The signal from the MIDI IN connector 13 is directly supplied here. Use a standard MIDI cable to connect this jack to the MIDI IN jack of another MIDI component.

13 **MIDI IN (MIDI input) connector** (DIN 5P)
Serves for input of the MIDI signal. Use a standard MIDI cable to connect the jack to the MIDI OUT (or MIDI THRU) jack of another MIDI component.

14 **REMOTE connector** (DIN 6P)
Serves for connection of an optional remote control unit (available soon).

15 **MEMORY UP jack** (standard phone jack)
Serves for connection of an optional foot switch (FS-11). Each push of the foot switch increases the preset memory or user memory number by one count.

16 **MEMORY DOWN jack** (standard phone jack)
Serves for connection of an optional foot switch (FS-11). Each push of the foot switch decreases the preset memory or user memory number by one count.

17 **EFFECT ON/OFF jack** (standard phone jack)
Serves for connection of an optional foot switch (FS-11). Each push of the foot switch toggles the unit between effect processing off ("E. OFF" is displayed) and on.

18 **HOLD ON/OFF jack** (standard phone jack)
Serves for connection of an optional foot switch (FS-11). One push of the foot switch causes the present effect sound to be maintained ("hold" is displayed). Signals input after this point are not processed. Another push of the switch resumes normal effect processing. This function is active in modes 0, 1, 2, and 7.

19 **OUTPUT jacks** (standard phone jacks)
Carry the output signals of channel 1 and 2.

20 **OUTPUT jacks** (RCA-type phono jacks)
Carry the output signals of channel 1 and 2.

21 **INPUT jacks** (RCA-type phono jacks)
Accept the input signal for channel 1 and 2.

22 **LEVEL selector**
This is used to match the input and output of the MU-R201 to the level of connected equipment.

+4 dB (depressed): For use with professional-type equipment.
– 20 dB (released): For use with consumer-type audio components, electronic instruments, etc.

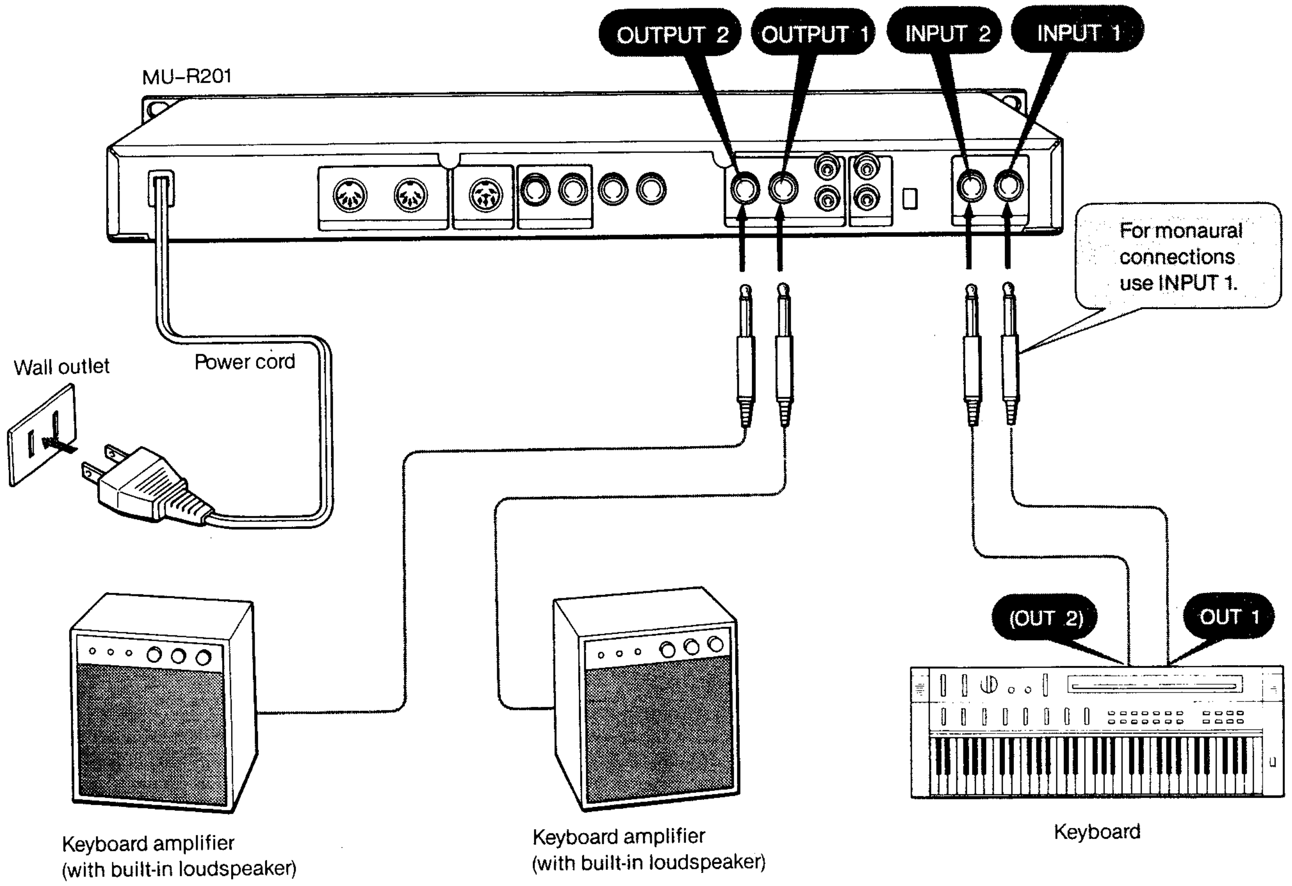
23 **INPUT jacks** (standard phone jacks)
Accept the input signal for channel 1 and 2.

Note
If both sets of input jacks are connected, the standard phone jacks are given priority over the RCA-type phono jacks.

1-2. CONNECTIONS

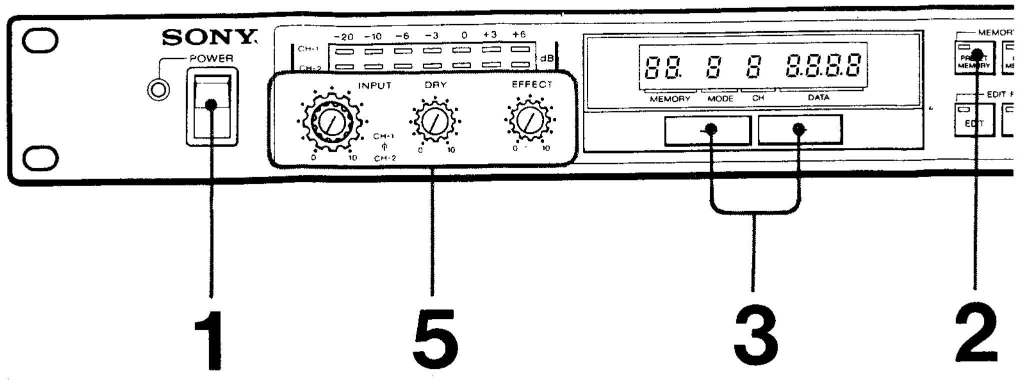
Notes on connections

- Set the power switches of the MU-R201 and all related equipment to OFF before making any connections.
- After connections are established, double-check for correctness and then plug the power cord of the MU-R201 into a wall outlet.

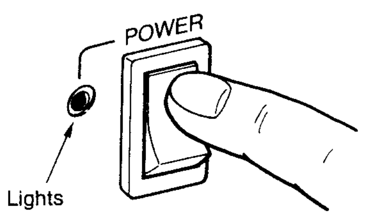

OUTPUT 2
OUTPUT 1
INPUT 2
INPUT 1
MU-R201
For monaural connections use INPUT 1.
Wall outlet
Power cord
(OUT 2)
OUT 1
Keyboard amplifier (with built-in loudspeaker)
Keyboard amplifier (with built-in loudspeaker)
Keyboard

Other connection examples are shown on page 31.

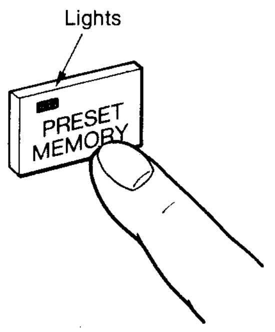
1-3. ACTIVATING A PRESET EFFECT


SONY
POWER
INPUT
DRY
EFFECT
MEMORY
MODE
CH
DATA
EDIT
1
5
3
2

1 Turn on the unit.

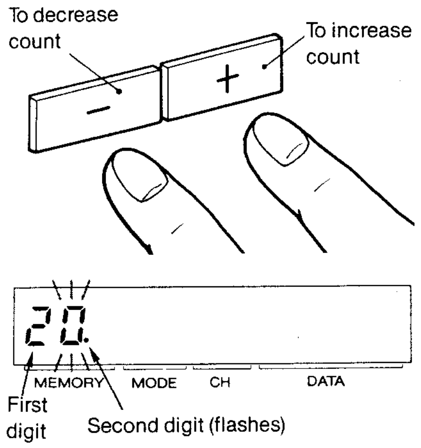

POWER
Lights

2 Press PRESET MEMORY.


Lights
PRESET MEMORY

Skip this step if the indicator is already lit.

3 Select the first digit of the preset number.


To decrease count
To increase count
−
+
20.
MEMORY
MODE
CH
DATA
First digit
Second digit (flashes)

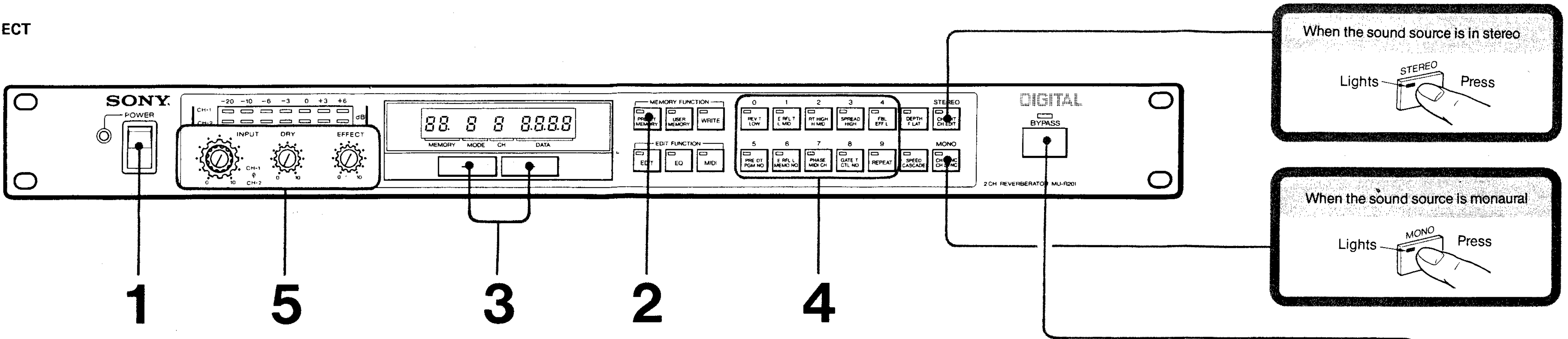
Skip this step if the desired digit is already shown.

4

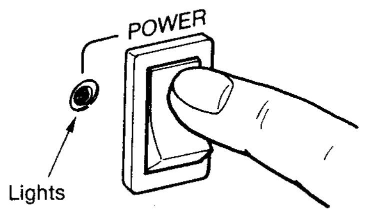
Before switching on connected equipment
To prevent switch-on thumps, turn down all level and volume controls.

Preset number range
Preset numbers from "00." to "99." can be selected.
For preset contents, refer to the table on page 6.

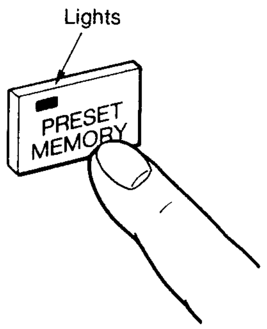
1-3. ACTIVATING A PRESET EFFECT


SONY
POWER
INPUT
DRY
EFFECT
MEMORY
MODE
CH
DATA
MEMORY FUNCTION
PRESET MEMORY
USER MEMORY
WRITE
EDIT FUNCTION
EDIT
EQ
MIDI
STEREO
MONO
DIGITAL
BYPASS
2 CH REVERBERATOR MU-R201
1
5
3
2
4
When the sound source is in stereo
Lights
STEREO
Press
When the sound source is monaural
Lights
MONO
Press

1 Turn on the unit.

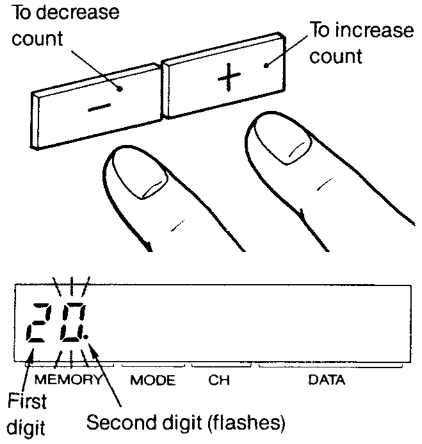

POWER
Lights

2 Press PRESET MEMORY.


Lights
PRESET MEMORY

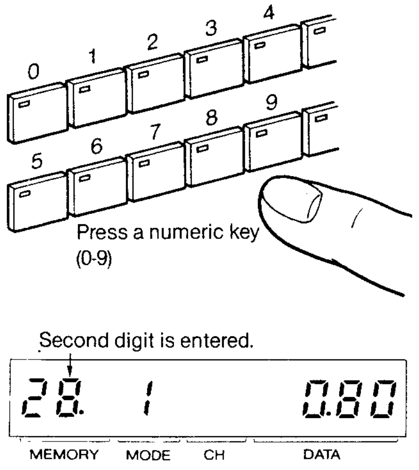
Skip this step if the indicator is already lit.

3 Select the first digit of the preset number.


To decrease count
To increase count
−
+
20.
MEMORY
MODE
CH
DATA
First digit
Second digit (flashes)

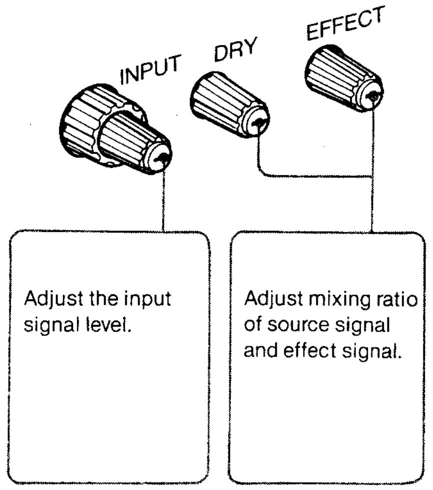
Skip this step if the desired digit is already shown.

4 Select the second digit of the preset number.


0
1
2
3
4
5
6
7
8
9
Press a numeric key (0-9)
Second digit is entered.
28. 1 0.80
MEMORY
MODE
CH
DATA

Data of selected preset memory are displayed.

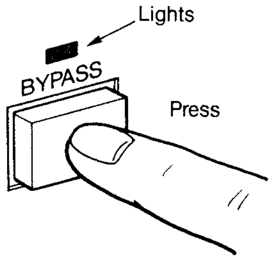
5 Adjust level controls.


INPUT
DRY
EFFECT

Adjust the input signal level.

Adjust mixing ratio of source signal and effect signal.

To bypass the reverberator


Lights
BYPASS
Press

Input signal is sent directly to output.
Press the button once more to release.

Before switching on connected equipment
To prevent switch-on thumps, turn down all level and volume controls.

Preset number range
Preset numbers from "00." to "99." can be selected.
For preset contents, refer to the table on page 6.

To select a different preset number
For a number with identical first digit, proceed with the step 4 to select the second digit. Otherwise repeat steps 3 and 4.

Switching between stereo and mono input
Stereo or mono input conditions are not stored in the memory and must be selected as required. When the unit is first switched on, the position selected during previous use is restored.

1-4. TABLE OF PRESET EFFECTS

The contents of memory numbers (chosen by steps 3 and 4 on the preceding page) are as follows.

- **Memory numbers 00.–09.**
  The standard settings of the ten basic modes 0–9 (described on pages 14 through 17) are stored in these numbers. The numbers correspond to the respective modes, for easy recall when creating your own effects.
- **Memory numbers 10.–64.**
  Effects mainly intended for studio recording or instrument performances.
- **Memory numbers 65.–74.**
  Effects for public-address applications and live events.
- **Memory numbers 75.–84.**
  Special effects for radio shows or live performances.
- **Memory numbers 85.–99.**
  Effects for hall simulation and creating ambience during audio playback.

Application	Memory number	Program	Application	Memory number	Program	Application	Memory number	Program
Standard patterns	00.	Hall	Recording, instrument use	34.	Flute	PA (SR) use	68.	Ballad (2)
	01.	Room		35.	Lyric Piano		69.	Male Vocal (1)
	02.	Plate		36.	Mystic Strings		70.	Male Vocal (2)
	03.	Gate Reverb		37.	Cathedral		71.	Female Vocal (1)
	04.	Reverse Reverb		38.	Guitar Reverb		72.	Female Vocal (2)
	05.	Delay		39.	Polyrhythm		73.	Female Vocal Ballad
	06.	Flash Panning		40.	Rock Vocal		74.	Solo Synthesizer
	07.	Dual Reverb		41.	Vibrato	Special effects	75.	Tunnel
	08.	Reverb & Gate		42.	Sharp Snare		76.	Stadium
	09.	Reverb & Delay		43.	Tom Beat		77.	Gymnasium
Recording, instrument use	10.	Large Hall		44.	Kick Gate		78.	Indoor Pool
	11.	Medieval Hall		45.	Fancy Kick		79.	Radio Play
	12.	Concert Hall		46.	Slip Gate		80.	Mecha-Voice
	13.	Piano Hall		47.	Heavy Reverse		81.	Cave
	14.	Chamber		48.	Reverse Slip		82.	Mountain Echo
	15.	Pipe Organ		49.	Scratch Reverse		83.	Karaoke (1)
	16.	Brass Solo		50.	Single Tapped Delay		84.	Karaoke (2)
	17.	Reggae		51.	Twin Delay	Audio use	85.	American Large Hall (1)
	18.	Shadow		52.	Tapped Delay		86.	American Large Hall (2)
	19.	Pinball		53.	Flying Delay		87.	European Large Hall (1)
	20.	Space Echo		54.	Panning Delay		88.	European Large Hall (2)
	21.	Compact Room		55.	Shadow Rhythm		89.	European Recital Hall
	22.	Powerful Drum		56.	Rose Piano		90.	Orchestra (1)
	23.	Woodwinds		57.	Auto Panning		91.	Orchestra (2)
	24.	Live House (1)		58.	Tremolo		92.	Chamber Music (1)
	25.	Live House (2)		59.	Twin Plate		93.	Chamber Music (2)
	26.	Vivid Snare		60.	Tom Tom		94.	Opera (1)
	27.	Piano Bar		61.	Ethnic Drum		95.	Opera (2)
	28.	Baroque		62.	Cliffverb		96.	Jazz (1)
	29.	Trumpet		63.	Solo Guitar & Metal Gate		97.	Jazz (2)
	30.	Beat Sound		64.	Special Beat		98.	Rock (1)
	31.	Snare	PA (SR) use	65.	Standard Vocal		99.	Rock (2)
	32.	Clear Reverb		66.	Rock Vocal			
	33.	Electric Guitar Distortion		67.	Ballad (1)			

For a detailed explanation of these effects, refer to page 35–44.

1-5. THE CONCEPT OF A REVERBERATOR

What Is Reverberation?

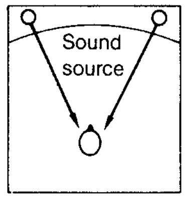
A sound which is produced within a limited space will be reflected from walls, objects, etc. With repeated reflections, the sound becomes less distinct, sound quality changes, and the level gradually decreases. This effect is especially marked for example in a concert hall. In acoustics, it is called reverb or reverberation.

Three Elements of the Sound Field

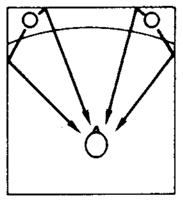
The sound field which is experienced by the listener for example in a concert hall is made up of three basic components:

- the direct sound arrival from the sound source
- the so-called early reflections from walls and ceiling, etc.
- the repeatedly reflected later sound arrivals, i.e. the reverberation

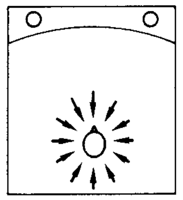
These three elements are always present, but their quality and ratio depend on numerous factors, such as size of the hall, shape of walls and ceiling, sound absorption characteristics of building and decorating materials, etc. Famous concert halls are carefully designed to achieve a certain reverberation, which gives each hall its own, unique ambience and sound character.



Direct sound arrival



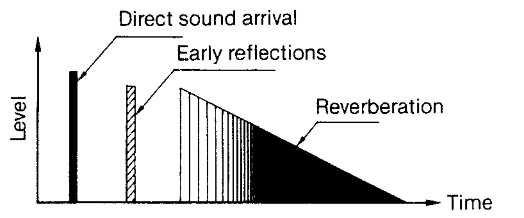
Early reflections



Reverberation

Reverberation with the MU-R201

When trying to recreate the ambient sound field by means of digital signal processing, using two monaural reverberator units does not produce fully satisfactory results. The width and depth of the sound stage present in the stereo will not be preserved with such an arrangement. This becomes obvious by picturing for example a sound which originates from the right side of the stage. Its early reflections on the right will reach the listener earlier than the reflections on the left, and the reverberant sound field also gradually spreads from the right. To achieve natural-sounding reverb in such a case requires a reverberator which provides stereo inputs, stereo signal processing, and stereo outputs. In the MU-R201, this goal is achieved by the use of a two-channel digital audio signal processing LSI and latest stereo algorithms, producing natural and effective reverberation of very high quality. Different algorithms are required for delay effects, gate reverb effects, and auto-panning effects. All algorithms were newly developed for the MU-R201 and form the basis of the ten different effect modes (0–9). By using these modes in combination with suitable parameters, a multitude of impressive and striking effects can be created.



Three components of reverberation

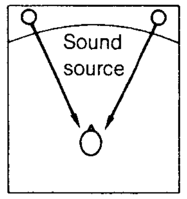
1-5. THE CONCEPT OF A REVERBERATOR

What Is Reverberation?
A sound which is produced within a limited space will be reflected from walls, objects, etc. With repeated reflections, the sound becomes less distinct, sound quality changes, and the level gradually decreases. This effect is especially marked for example in a concert hall. In acoustics, it is called reverb or reverberation.

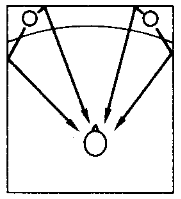
Three Elements of the Sound Field
The sound field which is experienced by the listener for example in a concert hall is made up of three basic components:

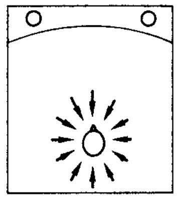
- the direct sound arrival from the sound source
- the so-called early reflections from walls and ceiling, etc.
- the repeatedly reflected later sound arrivals, i.e. the reverberation

These three elements are always present, but their quality and ratio depend on numerous factors, such as size of the hall, shape of walls and ceiling, sound absorption characteristics of building and decorating materials, etc. Famous concert halls are carefully designed to achieve a certain reverberation, which gives each hall its own, unique ambience and sound character.

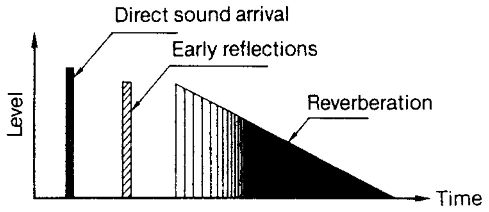


Direct sound arrival


Early reflections


Reverberation

Reverberation with the MU-R201
When trying to recreate the ambient sound field by means of digital signal processing, using two monaural reverberator units does not produce fully satisfactory results. The width and depth of the sound stage present in the stereo will not be preserved with such an arrangement. This becomes obvious by picturing for example a sound which originates from the right side of the stage. Its early reflections on the right will reach the listener earlier than the reflections on the left, and the reverberant sound field also gradually spreads from the right. To achieve natural-sounding reverb in such a case requires a reverberator which provides stereo inputs, stereo signal processing, and stereo outputs. In the MU-R201, this goal is achieved by the use of a two-channel digital audio signal processing LSI and latest stereo algorithms, producing natural and effective reverberation of very high quality. Different algorithms are required for delay effects, gate reverb effects, and auto-panning effects. All algorithms were newly developed for the MU-R201 and form the basis of the ten different effect modes (0–9). By using these modes in combination with suitable parameters, a multitude of impressive and striking effects can be created.



Three components of reverberation

1-6. ON PARAMETERS

EDIT FUNCTION PARAMETERS

The parameters and parameter ranges used for the EDIT function vary, depending on the mode. For details, refer to "Operation Modes" on page 14.

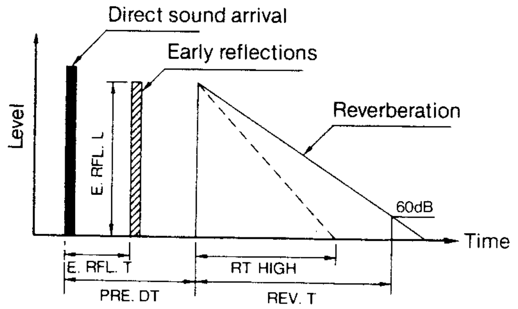
E. RFL. T. (Early Reflection Time)
The time required for the early reflections to reach the listener.

E. RFL. L. (Early Reflection Level)
The intensity of the early reflections.

REV. T. (Reverberation Time)
The time required for the reverberation to be attenuated by 60 dB. In modes 5, 6 and 9 (channel 2), this value corresponds to the delay time.

PRE. DT (Pre-Delay Time)
The interval between the direct sound arrival and the start of reverberation.

RT HIGH (Rotate High)
Due to the high-frequency sound-absorbing characteristics of walls, etc., the high frequency range of the reverberation decays faster than the low frequency range. This attenuation is expressed as a ratio of the reverb time. Higher values result in a live sound character.



Basic parameters for reverberation effect

SPREAD
This parameter defines the width of the sound stage.
It controls the time required for each single reflection to reach the listener.

PHASE
Determines the phase relationship of the early reflections and the feedback signal. When E. RFL. L. and FBL are set to negative values, the phase is reversed.

FBL
Determines at which ratio the repeat output is fed back to the input for delay effect in modes 5, 6 and 9 (channel 2).

REPEAT
Determines the number of repeat output signals for the delay effect in mode 5 and mode 9 (channel 2). Depending on the REV. T. value, a maximum of 20 repeats can be selected.

GATE T. (Gate Time)
Determines the interval between start of reverberation and cut of reverberation by the gate circuit. Used for gate reverb of mode 3 and mode 8 (channel 2), and for reverse reverb in mode 4.

DEPTH
Determines the panning depth for auto-pan of mode 6.

SPEED
Determines the panning speed for auto-pan of mode 6.

EQ FUNCTION PARAMETERS

• LOW	100 Hz, ±12 dB
• L MID (Low Mid)	400 Hz ±12 dB
• H MID (High Mid)	1.6 kHz ±12 dB
• HIGH	6.4 kHz ±12 dB

The parameters of the two-channel, four-band equalizer can be adjusted at the respective center frequencies over a range of ±12 dB in 2-dB steps.

EFF. L (Effect Level)
Serves to preset the output level that is produced when the EFFECT control is at maximum.

CASCADE
Permits cascade (serial) connection of effects produced in channel 1 and channel 2. This function uses digital signal processing and is available in modes 8 and 9.

1-7. OPERATING MODES

MODE 0 (Hall)

This mode creates spacious reverberation as experienced in a large concert hall or an open-air stage setting.
A newly developed algorithm for stereo processing provides a wide-spread sound stage.
Besides total reverberation, this mode is also suited for instrument effects such as guitar and keyboard play or for use with vocals during recording.

Basic parameters

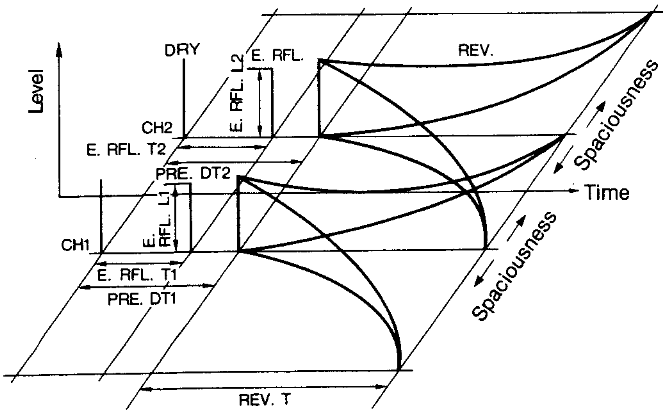
REV. T.	0.3—99.0sec
PRE. DT	1—733msec (CH1, 2)
E. RFL. T.	1—733msec (CH1, 2)
E. RFL. L.	0.000—±0.992 (CH1, 2) ±designates the phase (set with PHASE)
RT HIGH	0.01—0.99
SPREAD	1—16

One-point advice

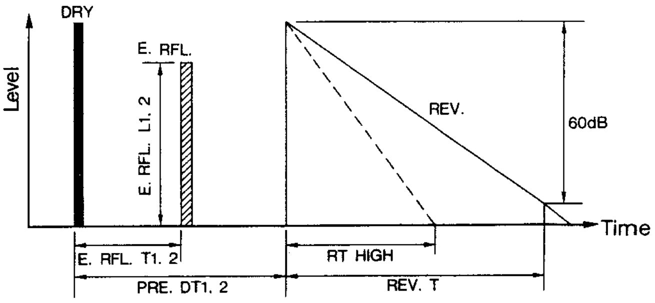
To simulate a large concert hall, set REV. T. to a somewhat lower value and achieve the designed effect with PRE. DT.
E. RFL. L. should also be kept low. The following values may serve as a guideline.

REV. T.	1.5—3.8sec
PRE. DT	50—120msec
E. RFL. T.	30—80msec
E. RFL. L.	0.101—0.992
RT HIGH	0.40—0.50 (Do not make the setting too live.)
SPREAD	8—13 (Spacious impression is critical.)

PRE. DT., E. RFL. T., and E. RFL. L. can be set for each channel separately, but for a normal hall, identical values should be chosen. When using the effect for piano, selecting different E. RFL. T. and E. RFL. L. setting for channel 1 and channel 2 should give best results.


Level
DRY
E. RFL. L2
E. RFL.
REV.
CH2
E. RFL. T2
PRE. DT2
Time
Spaciousness
CH1
E. RFL. L1
E. RFL. T1
PRE. DT1
Spaciousness
REV. T

The numbers 1, 2 in the chart denote channel 1 and 2.

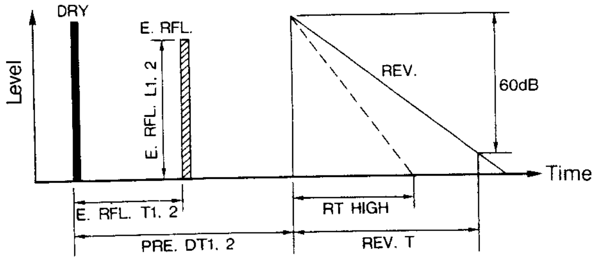

Level
DRY
E. RFL.
E. RFL. L1. 2
REV.
60dB
Time
E. RFL. T1. 2
RT HIGH
PRE. DT1. 2
REV. T

MODE 1 (Room)

This mode creates the reverberation of a comparatively small location such as an echo room or a smaller club. As with mode 0, the application range is wide and varied. Reverberation is tight and fairly sharp, resulting in a controlled and lively sound stage.

Basic parameters

REV. T.	0.07—24.75sec
PRE. DT	1—733msec (CH1, 2)
E. RFL. T.	1—733msec (CH1, 2)
E. RFL. L.	0.000—±0.992 (CH1, 2) ±designates the phase (set with PHASE)
RT HIGH	0.01—0.99
SPREAD	1—16



One-point advice

The setting procedure of mode 1 is basically the same as for mode 0. For simulating a setting such as small live-performance club, RT HIGH and SPREAD should be carefully controlled. The following values may serve as a guideline.

REV. T.	0.70—1.00sec
PRE. DT	20—80msec
E. RFL. T.	8—50msec
E. RFL. L.	0.500—0.992
RT HIGH	0.40—0.80 (Determines "liveness".)
SPREAD	3—6 (Keep spread to a somewhat lower value.)

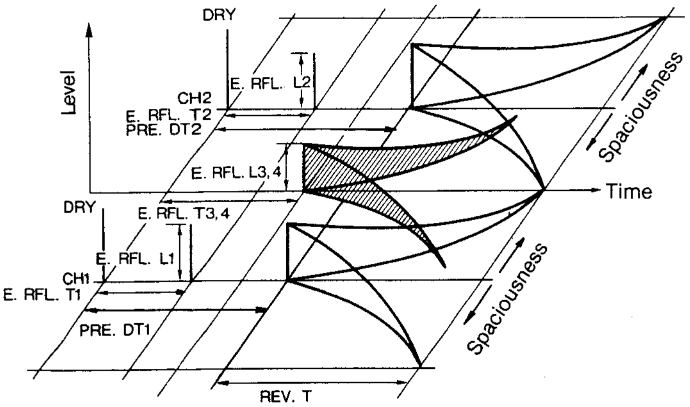
PRE. DT, E. RFL. T., and E. RFL. L. can be set for each channel separately, which may be used to emphasize the feeling of an intimate, live setting. The four-band equalizer can also be used to create a particular sound character.

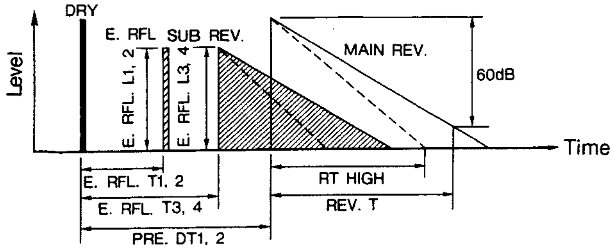
MODE 2 (Plate)

This mode produces plate reverberation. Which is the most commonly used type of reverb in recording studios. The smooth, tight impression created by this mode is especially suited for enhancing the brilliance of vocal and strings.

Basic parameters

REV. T.	0.3—99.0sec
PRE. DT	1—733msec (CH1, 2)
E. RFL. T.	1—733msec (CH1, 2, 3, 4)
E. RFL. L.	0.000—±0.992 (CH1, 2, 3, 4) ±designates the phase (set with PHASE)
RT HIGH	0.01—0.99
SPREAD	1—16


DRY
Level
CH2
E. RFL. L2
E. RFL. T2
PRE. DT2
E. RFL. L3, 4
DRY
E. RFL. T3, 4
E. RFL. L1
CH1
E. RFL. T1
PRE. DT1
REV. T
Time
Spaciousness
Spaciousness


DRY
Level
E. RFL
SUB REV.
E. RFL. L1, 2
E. RFL. L3, 4
MAIN REV.
60dB
Time
E. RFL. T1, 2
E. RFL. T3, 4
PRE. DT1, 2
RT HIGH
REV. T

One-point advice

Besides the main reverberation, mode 2 also provides sub reverb (channel 3 and channel 4 of E. RFL. T. and E. RFL. L.). For the main reverberation, there is no crosstalk between the channels, but reverb density is high, with a spacious feeling. Sub reverb has less stereo spread and is more centered (shaded section in the illustration).

By placing the sub reverb behind the main reverb, the reverberation is first heard on a wider plane and then becomes focused towards the center. By reversing this setting, i.e. placing main reverb behind sub reverb, reverberation spreads out from the center. The following values may serve as a guideline.

REV. T.		0.8—3.0sec
PRE. DT		20—250msec
E. RFL. T.	CH1, 2	8—200msec
	CH 3,4	20—150msec
E. RFL. L.	CH1, 2	0.101—0.992
	CH3, 4	0.250—0.750
RT HIGH		0.50—0.80
SPREAD		8—14

Main reverb and sub reverb have different wave characteristics. By mixing the two effects, the desired characteristics can be achieved.

Note

The sub reverb of channel 1 is shown as channel 3, and the sub reverb of channel 2 as channel 4.

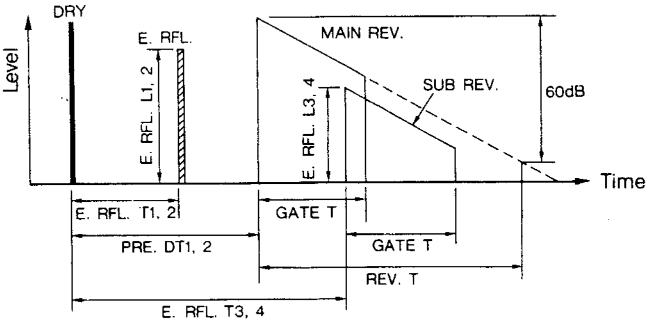
MODE 3 (Multi Gate Reverb)

This mode is used mainly for special drum and percussion effects, with the reverberation being cut off by a gate circuit after a certain interval.
PRE DT. 1 and 2, and E. RFL. 3 and 4 determine the gate timing, resulting in multi-gate reverb. SPREAD creates novel sound characteristics that cannot be achieved merely by equalizing. As there is no channel crosstalk, the MU-R201 can also be used in place of two gate reverb units.

Basic parameters

REV. T.	0.1—99.0sec
PRE. DT	1—850msec (CH1, 2)
E. RFL. T.	1—850msec (CH1, 2, 3, 4)
E. RFL. L.	0.000—±0.992 (CH1, 2, 3, 4) ±designates the phase (set with PHASE)
SPREAD	1—12 (CH1, 2)...Controls spaciousness 1—16 (CH3, 4)...Controls density
GATE T	1—300msec

One-point advice
When using gate reverb for percussive instruments, it is vital to carefully control PRE. DT and GATE T in accordance with the tempo of the instrument.
The impression of sudden cut-off can be softened by adding sub reverb before the main reverb is terminated by the gate.
When the REV. T is set to more than 50 sec, a special gate reveb effect is obtained.


DRY
Level
E. RFL.
E. RFL. L1, 2
MAIN REV.
E. RFL. L3, 4
SUB REV.
60dB
Time
E. RFL. T1, 2
GATE T
PRE. DT1, 2
GATE T
REV. T
E. RFL. T3, 4

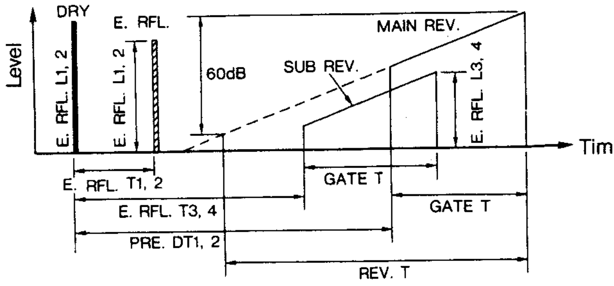
MODE 4 (Multi Reverse Reverb)

This special effect, which is possible only with digital signal processing, calls up the gate reverb in reverse. It is suited mainly for percussive instruments such as cymbals, etc. The functions are the same as in mode 3.

Basic parameters

REV. T.	0.1—99.0sec
PRE. DT	1—850msec (CH1, 2)
E. RFL. T.	1—850msec (CH1, 2, 3, 4)
E. RFL. L.	0.000—±0.992 (CH1, 2, 3, 4) ±designates the phase (set with PHASE)
SPREAD	1—12 (CH1, 2)...Controls spaciousness 1—16 (CH3, 4)...Controls density
GATE T	1—300msec

One-point advice
The reverse gate effect may be emphasized by setting PRE. DT to a fairly high value.
When sub reverb is inserted before main reverb, the impression of momentary signal loss can be reduced.
As with mode 3, setting REV. T to more than 50 sec. produces a special reverse reverb effect.


DRY
Level
E. RFL. L1, 2
E. RFL.
E. RFL. L1, 2
60dB
SUB REV.
MAIN REV.
E. RFL. L3, 4
Time
E. RFL. T1, 2
GATE T
E. RFL. T3, 4
GATE T
PRE. DT1, 2
REV. T

MODE 5 (Dual Multi Delay)

This mode provides a separate multi delay in both channels, so that the unit can be used like two independent delay machines. Up to 20 repeat outputs are possible.
By using feedback, the delay effect can be precisely controlled.

Basic parameters

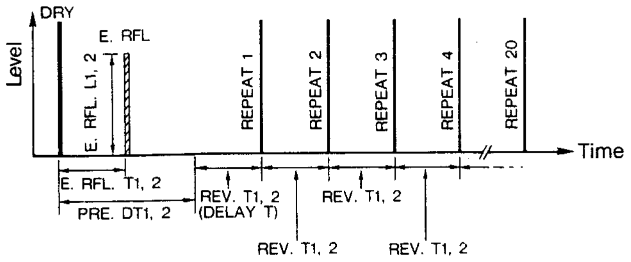
REV. T. (Delay T)	1—1001msec (CH1, 2)
PRE. DT	0—255msec (CH1, 2)
E. RFL. T.	1—256msec (CH1, 2)
E. RFL. L.	0.000—±0.992 ±designates the phase (set with PHASE)
RT HIGH	0.01—0.99 (CH1, 2)
FBL	0.000—±0.992 (CH1, 2) ±designates the phase (set with PHASE)
REPEAT	0—20 (CH1, 2) Number of repeats changes with the REV. T. setting

One-point advice

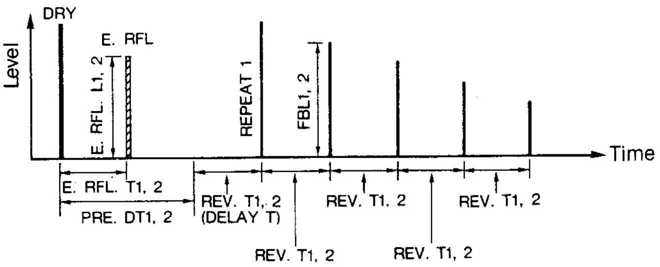
By selecting the following values and controlling FBL, the same effect as with a conventional delay machine can be achieved.

REPEAT	1
E. RFL. L.	0
PRE. DT	0

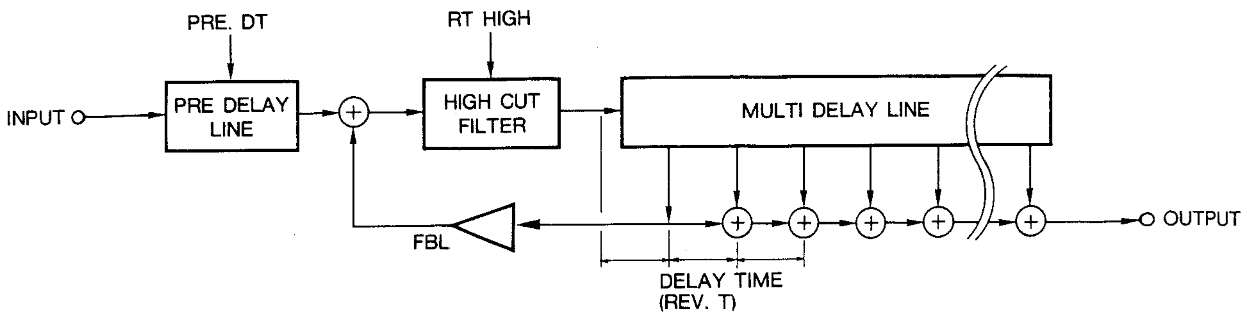
Special effects can be created for example by adjusting E. RFL. and REPEAT according to the tempo of the music, increasing the number of repeats and using feedback, or reversing the phase.


DRY
Level
E. RFL
E. RFL. L1, 2
REPEAT 1
REPEAT 2
REPEAT 3
REPEAT 4
REPEAT 20
Time
E. RFL. T1, 2
PRE. DT1, 2
REV. T1, 2 (DELAY T)
REV. T1, 2
REV. T1, 2
REV. T1, 2

Delay effect (without feedback)


DRY
Level
E. RFL
E. RFL. L1, 2
REPEAT 1
FBL1, 2
Time
E. RFL. T1, 2
PRE. DT1, 2
REV. T1, 2 (DELAY T)
REV. T1, 2
REV. T1, 2
REV. T1, 2
REV. T1, 2

Delay effect (with one repeat and feedback)


PRE. DT
RT HIGH
INPUT
PRE DELAY LINE
HIGH CUT FILTER
MULTI DELAY LINE
FBL
OUTPUT
DELAY TIME (REV. T)

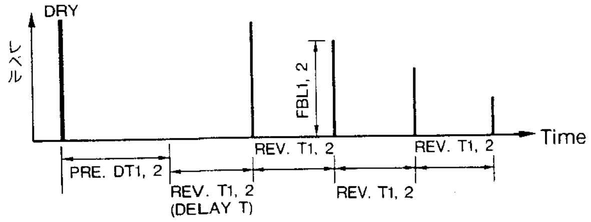
Block diagram of dual multi delay (one channel)

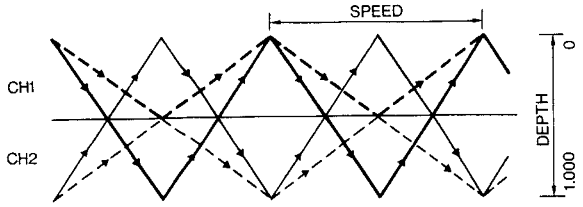
MODE 6 (Multi Auto-Pan)

In this mode, the delay signal is used for feedback, and the auto-panning function is carried out on the resulting signal.

Basic parameters

REV. T. (Delay T)	0—1001msec (CH1, 2)
PRE. DT	0—255msec (CH1, 2)
RT HIGH	0.01—0.99 (CH1, 2)
FBL	0.000—±0.992 (CH1, 2) ±designates the phase (set with PHASE)
DEPTH	0.000—1.000
SPEED	0.10—20.00Hz





Panning characteristics ⇉ DEPTH: 1.000

⇢ DEPTH: 0.500

One-point advice

By using different sources (for example strings in channel 1, harpsichord in channel 2) and slowly carring out auto-panning, an impressive effect can be achieved. The following values may serve as a guideline.

REV. T.	30—150msec
PRE. DT	20—50msec
RT HIGH	0.40—0.80
FBL	0.500—0.804
DEPTH	0.804—1.000
SPEED	0.50—0.80Hz

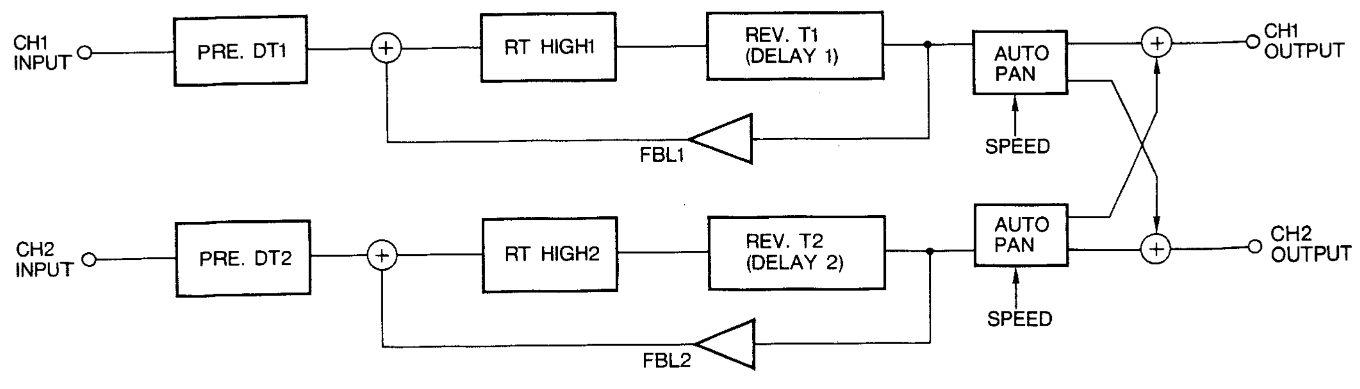
When the same signal is used in both channels, different REV. T. and PRE. DT settings should be chosen.

REV. T.	CH1	30—150msec
	CH2	80—200msec
PRE. DT	CH1	20—50msec
	CH2	30—80msec
FBL	CH1	0.500—0.804
	CH2	0.304—0.500

For organ, setting DEPTH to "1.000" and SPEED to about "8", and applying suitable REV. T. and FBL, a tremolo effect can be produced.

Notes

- If the same signal is present in both channels and the same settings are chosen, auto-panning will have no effect.
- In this mode, stereo operation is chosen automatically, regardless of the position of the STEREO/MONO indicator.



Block diagram of auto-panning function

MODE 7 (Dual Reverb)

This mode provides separate reverb in both channels, so that the unit can be used like two independent reverberators. Reverberation is tight, with an effect similar to plate reverb. Separate sources can be fed to channel 1 and channel 2, permitting a wide range of applications.

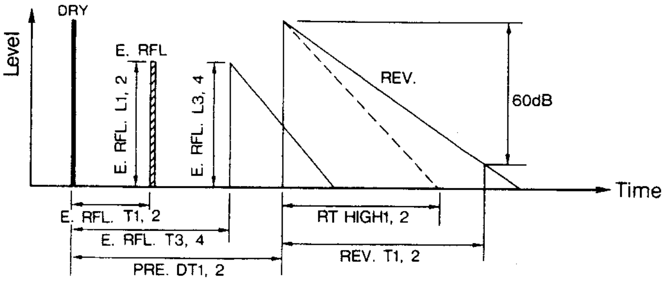
Basic parameters

REV. T.	0.90—9.90sec (CH1, 2)
PRE. DT	1—572msec (CH1, 2)
E. RFL. T.	1—572msec (CH1, 2, 3, 4)
E. RFL. L.	0.000—±0.992 (CH1, 2, 3, 4) ±designates the phase (set with PHASE)
RT HIGH	0.01—0.99 (CH1, 2)
SPREAD	1—16 Setting to 16 produces same effect for channels 1 and 2

One-point advice

The setting for mode 7 is practically the same as for mode 2 (plate reverberation), except for the fact that there is no crosstalk between channels.

SPREAD cannot be set for the channels independently. In ordinary use, it should be set to "16" for identical results in both channels. By selecting a value of "15" or lower, a slight stereo effect can be produced.


DRY
Level
E. RFL
E. RFL. L1, 2
E. RFL. L3, 4
REV.
60dB
Time
E. RFL. T1, 2
E. RFL. T3, 4
PRE. DT1, 2
RT HIGH1, 2
REV. T1, 2

MODE 8 (Reverb & Gate)

In this mode, channel 1 operates with the reverb effect of mode 7, and channel 2 with the gate reverb effect of mode 3. Sub reverb is not available.

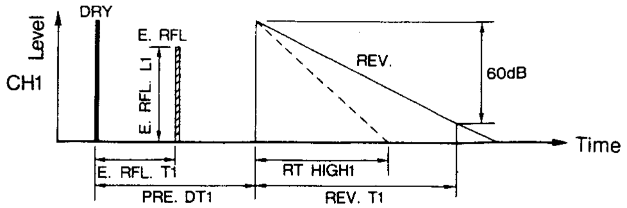
It can be used, for example, for vocals in channel 1 and drums and percussion in channel 2.

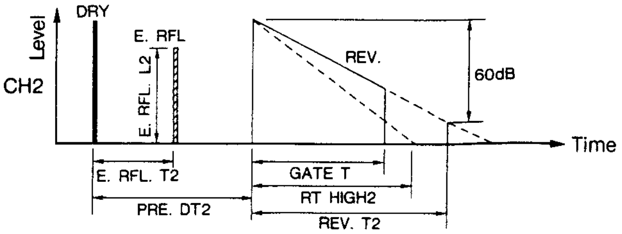
Basic parameters

REV. T.	0.90—9.90sec (CH1)
	0.1—99.0sec (CH2)
PRE. DT	1—572msec (CH1)
	1—850msec (CH2)
E. RFL. T.	1—572msec (CH1)
	1—850msec (CH2)
E. RFL. L.	0.000—±0.992 (CH1, 2) ±designates the phase (set with PHASE)
RT HIGH	0.01—0.99 (CH1, 2)
SPREAD	1—16 (CH1)
	1—12 (CH2)
GATE	1—300msec (CH2)

One-point advice

By using cascade connection (channel 1→channel 2 or vice versa), special effects can be created.


Level
CH1
DRY
E. RFL
E. RFL. L1
REV.
60dB
Time
E. RFL. T1
PRE. DT1
RT HIGH1
REV. T1


Level
CH2
DRY
E. RFL
E. RFL. L2
REV.
60dB
Time
E. RFL. T2
PRE. DT2
GATE T
RT HIGH2
REV. T2

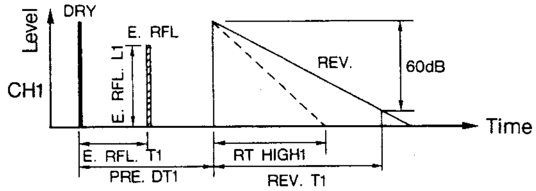
MODE 9 (Reverb & Delay)

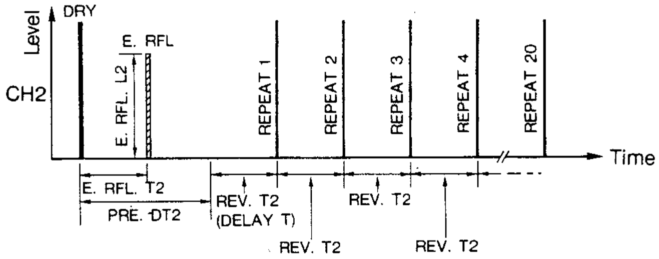
In this mode, channel 1 operates with the reverb effect of mode 7, and channel 2 with the delay effect of mode 5. Sub reverb is not available.
This may be used, for example, to process vocals in channel 1 and keyboards in channel 2.

Basic parameters

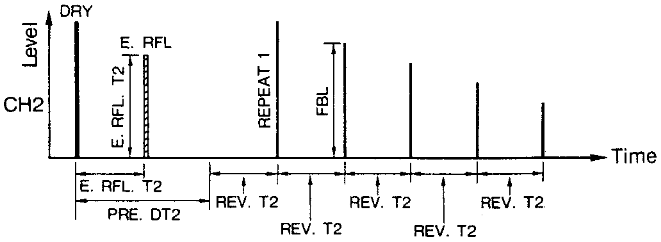
REV. T. (Delay T)	0.90—9.90sec (CH1)
	1—1001msec (CH2)
PRE. DT	1—572msec (CH1)
	0—255msec (CH2)
E. RFL. T.	1—572msec (CH1)
	1—256msec (CH2)
E. RFL. L.	0.000—±0.992 ±designates the phase (set with PHASE)
RT HIGH	0.01—0.99 (CH1, 2)
SPREAD	1—16 (CH1)
FBL	0.000—±0.992 (CH2) ±designates the phase (set with PHASE)
REPEAT	0—20 (CH2) Number of repeats changes with the REV. T setting

One-point advice
By using cascade connection (channel 1→channel 2 or vice versa), special effects can be created.


Level
DRY
E. RFL
CH1
E. RFL. L1
REV.
60dB
Time
E. RFL. T1
RT HIGH1
PRE. DT1
REV. T1


Level
DRY
E. RFL
CH2
E. RFL. L2
REPEAT 1
REPEAT 2
REPEAT 3
REPEAT 4
REPEAT 20
Time
E. RFL. T2
PRE. DT2
REV. T2
(DELAY T)
REV. T2
REV. T2
REV. T2

Delay effect (without feedback)


Level
DRY
E. RFL
CH2
E. RFL. T2
REPEAT 1
FBL
Time
E. RFL. T2
PRE. DT2
REV. T2
REV. T2
REV. T2
REV. T2
REV. T2

Delay effect (with one repeat and feedback)

PARAMETER QUICK REFERENCE CHART

This chart lists all parameters described on the preceding pages.

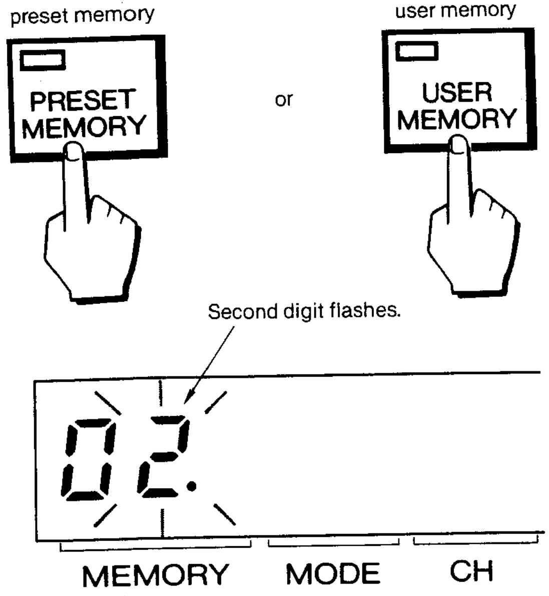
Mode Parameter		0	1	2	3	4	5	6	7	8	9	Range
REV. T.		0		0								0.3—99.0sec
			0									0.07—24.75sec
					0	0				2		0.1—99.0sec
									1, 2	1	1	0.90—9.90sec
							1, 2				2	1—1001msec
								1, 2				0—1001msec
PRE. DT		1, 2	1, 2	1, 2								1—733msec
					1, 2	1, 2				2		1—850msec
							1, 2	1, 2			2	0—255msec
									1, 2	1	1	1—572msec
E. RFL. T.		1, 2	1, 2	1,2,3,4								1—733msec
					1,2,3,4	1,2,3,4				2		1—850msec
							1, 2				2	0—255msec
									1,2,3,4	1	1	1—572msec
E. RFL. L.		1, 2	1, 2	1,2,3,4	1,2,3,4	1,2,3,4	1, 2		1,2,3,4	1, 2	1, 2	±.000—±.992
RT HIGH		0	0	0			1, 2	1, 2	1, 2	1	1, 2	0.01—0.99
SPREAD		0	0	0	3, 4	3, 4			0	1	1	1—16
					1, 2	1, 2				2		1—12
GATE T					0	0				2		1—300
FBL							1, 2	1, 2				±.000—±.992
REPEAT							1, 2					0—20
DEPTH								0				.000—1.000
SPEED								0				0.10—20.00Hz
EQ	**LOW**	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	−12—12 dB
	L. MID	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	−12—12 dB
	H. MID	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	−12—12 dB
	HIGH	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	−12—12 dB
EFF L		1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	1, 2	.000—1.000
CASCADE										0	0	OFF, 1—2, 2—1

0	common for both channels
1	channel 1 only
2	channel 2 only
1, 2	separate for channels 1 and 2
3, 4	separate for channels 3 and 4
1, 2, 3, 4	separate for channels 1, 2, 3, 4

1-8. RECALLING MEMORY SETTINGS (MEMORY FUNCTION)

Proceed as follows to recall stored effects. The parameter buttons operates as numeric keys.

1 Press PRESET MEMORY or USER MEMORY.


PRESET MEMORY
or
USER MEMORY
02.
MEMORY
MODE
CH

To recall preset memory

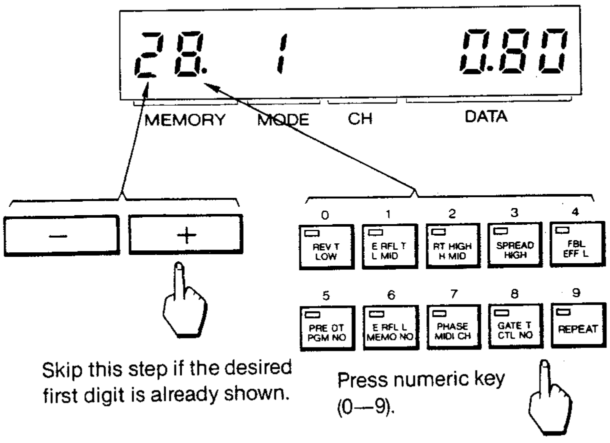
To recall user memory

Second digit flashes.

Previously selected memory number is displayed.

2 Adjust first digit of memory number with + and −.

3 Enter second digit of memory number with numeric keys.


28. 1 0.80
MEMORY
MODE
CH
DATA
−
+
0
1
2
3
4
REV T LOW
E RFL T L MID
RT HIGH H MID
SPREAD HIGH
FBL EFF L
5
6
7
8
9
PRE DT PGM NO
E RFL L MEMO NO
PHASE MIDI CH
GATE T CTL NO
REPEAT

Skip this step if the desired first digit is already shown.

Press numeric key (0—9).

When the second digit has been entered

The memory number, mode number, and REV. T setting (SPEED for mode 6) are shown on the display. (The REV. T or SPEED indicator lights.) The effect memorized with the number displayed will be activated.

To select another memory number

- To change the entire memory number (PRESET or USER), repeat from step 1.
- To change the first digit only, repeat from step 2.
- To change the second digit only, repeat from step 3.

User memory

The unit is shipped with the PRESET memory values are also stored in the USER memory at the factory.

1-9. EDITING EFFECTS (EDIT FUNCTION)

Proceed as follows to edit stored effects and to create your own settings.
The function of the parameter buttons is as shown by the white lettering.

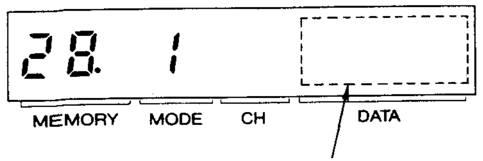
1 Select the memory number to be editted.

Proceed with steps described in page 23.

2 Press EDIT.

Lights
EDIT

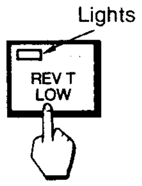
The indicators of parameter buttons whose contents can be changed are flashing.

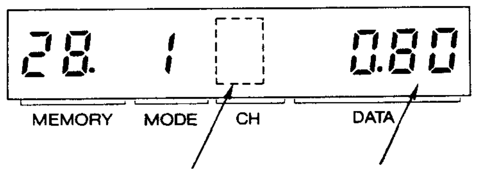


Parameter value disappears.

3 Press the buttons of the parameter to be changed.

For example, press

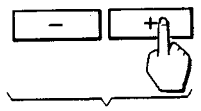




For parameters with channel settings, the selected channel number is shown here.

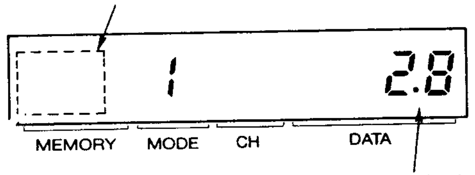
Current value of selected parameter is shown.

4 Set value with + and –.



Change parameter value.

Memory number disappears.



New value is shown.

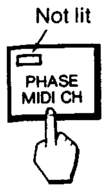
As the sound changes immediately with the value, the parameter settings can be verified by ear.

Changing other parameters

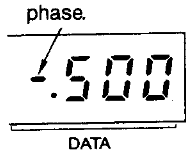
Repeat steps 3 and 4. If an invalid parameter key is pressed, the indicator does not light and the display remains unchanged.

To invert the phase

Press PHASE while the E. RFL or FBL parameter is selected.

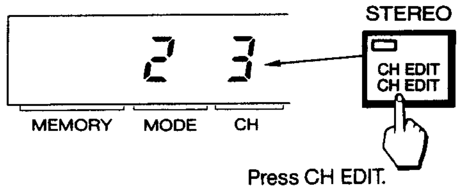


Negative indication shows inverted phase.



Pressing the button once more restores normal phase (negative indication disappears).

Selecting the parameter channel



Press CH EDIT.

Each push of the CH EDIT button changes the setting as follows.

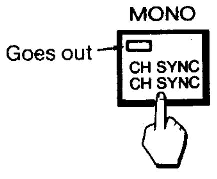
- CH 1, CH 2 active:

→ CH 1 → CH 2 ⏎

- CH 1, CH 2, CH 3, CH 4 active:

→ CH 1 → CH 2 → CH 3 → CH 4 ⏎

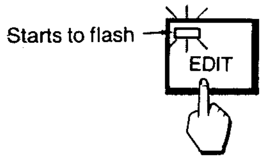
Selecting separate values for each channel



If the indicator of the CH SYNC button is lit, press the button.

Indicator of CH SYNC button lit: Parameter values for channels 1 and 2, and 3 and 4 are set together.
Indicator of CH SYNC button out: Parameter values for each channel are set independently.
Note that pressing the CH SYNC button while the button is out causes the value of the other channel to become the value of the currently selected channel.

To compare effects to initial setting



Prress EDIT button once more.

- All parameters are reset to their initial values.
- In this condition, all controls except the EDIT button are inactive. If the displayed parameter has a channel setting, the CH EDIT button can be used to check the value for each channel.
- Pressing the EDIT button once more returns the unit to the changed parameters.

Note

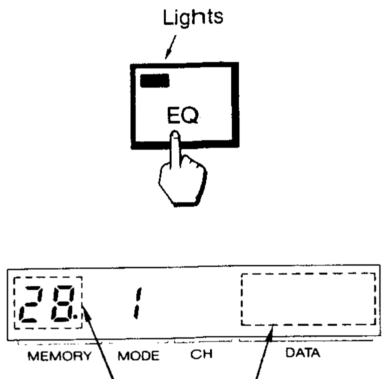
If the memory number is changed with the MEMORY function during editing, the currently edited data are lost.

1-10. CHANGING EFFECTS (EQ FUNCTION)

Proceed as follows to change the sound with the two-channel, four-band equalizer or to adjust the effect level.
The function of the parameter buttons is as shown by the blue lettering.

Changing equalizer settings.

1 Press EQ.


Lights
EQ
28. 1
MEMORY
MODE
CH
DATA

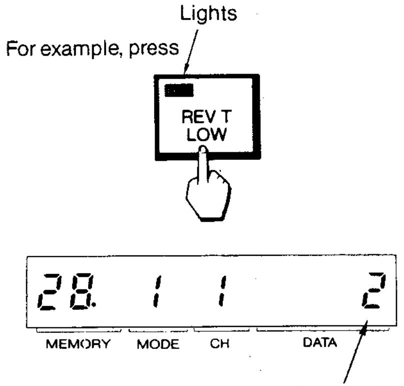
When EQ is pressed during editing, the memory number display disappears.

Parameter value disappears.

The parameter indicators are flashing.

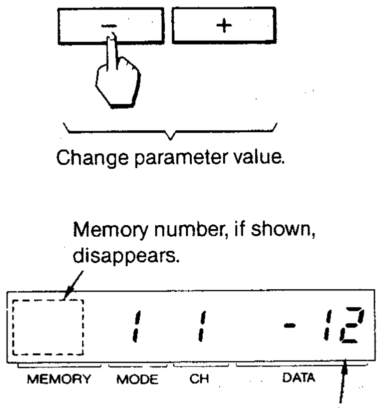
2 Press the button of the parameter to be changed.

For example, press


Lights
REV T
LOW
28. 1 1 2
MEMORY
MODE
CH
DATA

Value of selected parameter is shown.

3 Set value with + and –.


–
+
1 1 -12
MEMORY
MODE
CH
DATA

Change parameter value.

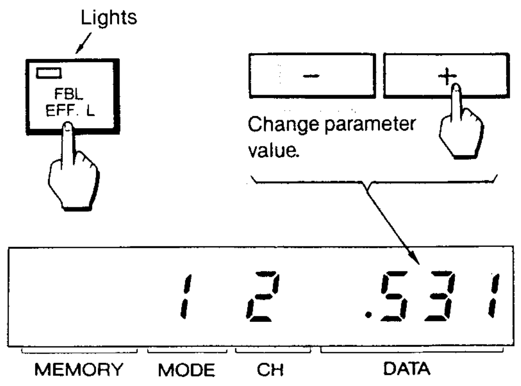
Memory number, if shown, disappears.

New value is displayed.

As the sound changes immediately with the value, the settings can be verified by ear.

Setting the effect level

Press EFF. L.


Lights
FBL
EFF. L
–
+
1 2 .531
MEMORY
MODE
CH
DATA

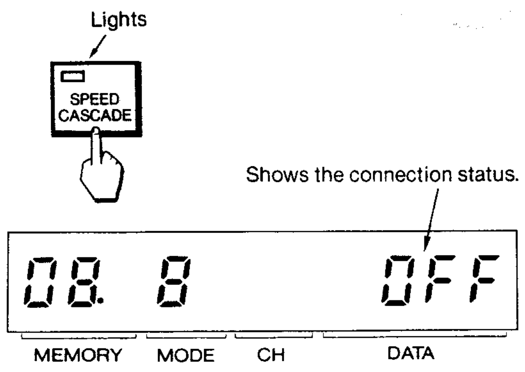
Change parameter value.

"1.000" denotes the maximum output level, and "000" the minimum output level (no effect).
By setting the output level to a suitable value for each effect, readjustment of mixing level when changing effects during a performance is not necessary.

Cascade connection

This feature is available in modes 8 and 9.

Press CASCADE.


Lights
SPEED
CASCADE
08. 8 OFF
MEMORY
MODE
CH
DATA

Shows the connection status.

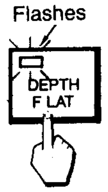
Select the desired connection type with + and –.

+ key ······ → OFF → 1-2 → 2-1 ┐

– key ······ ┌ OFF ← 1-2 ← 2-1 ←

Changing other parameters
Repeat steps 2 and 3. If an invalid parameter button is pressed, the indicator does not light and the display remains unchanged.

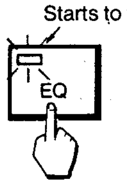
To listen to the flat setting
Press FLAT while the equalizer parameter (LOW, L MID, H MID, or HIGH) is selected.


Flashes
DEPTH
FLAT

Pressing FLAT once more returns the unit to the equalized setting.

To listen to the unchanged effect

Press EQ once more.

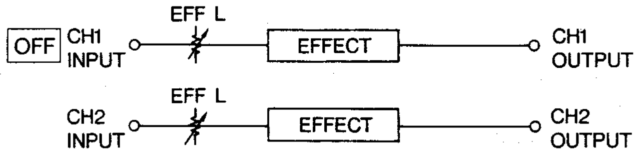

Starts to flash
EQ

- All parameters are reset to their initial values.
- In this condition, all control except the EQ button are inactive. If the displayed parameter has a channel setting, the CH EDIT button can be used to check the value for each channel.
- Pressing the EQ button once more returns the unit to the changed parameters.

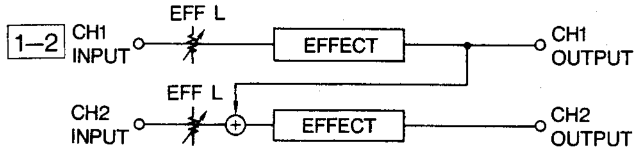
Using the CH EDIT and CH SYNC buttons
These buttons operate in the same way as for the EDIT function (refer to page 23 and 24.)

Note
If the memory number is changed with the MEMORY function during editing, the currently changed data are lost.

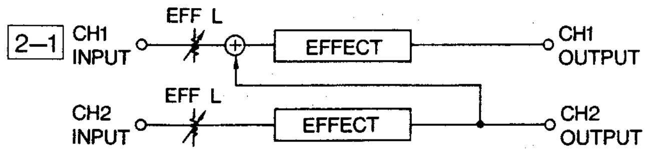
Cascade connection block diagram


OFF
CH1 INPUT
EFF L
EFFECT
CH1 OUTPUT
CH2 INPUT
EFF L
EFFECT
CH2 OUTPUT

Effects of channel 1 and channel 2 are supplied to the output.


1–2
CH1 INPUT
EFF L
EFFECT
CH1 OUTPUT
CH2 INPUT
EFF L
EFFECT
CH2 OUTPUT

The reverberation effect of channel 1 is supplied to that channel's output and also mixed to the input of channel 2. After gate or delay processing, it appears at the output of channel 2.

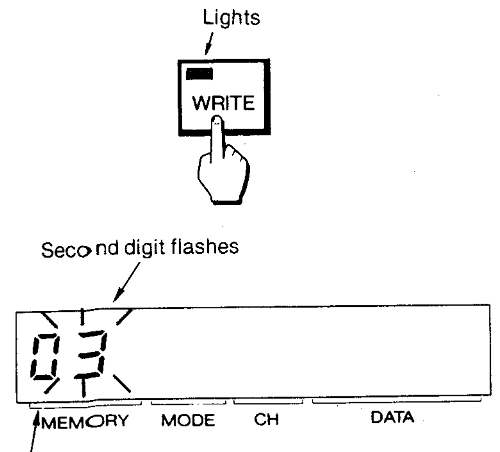

2–1
CH1 INPUT
EFF L
EFFECT
CH1 OUTPUT
CH2 INPUT
EFF L
EFFECT
CH2 OUTPUT

The gate or delay processed signal of channel 2 is supplied to that channel's output and also mixed to the input of channel 1. After reverberation processing, it appears at the output of channel 1.

1-11. STORING DATA (WRITE FUNCTION)

Proceed as follows to store edited or equalized parameters in the user memory.

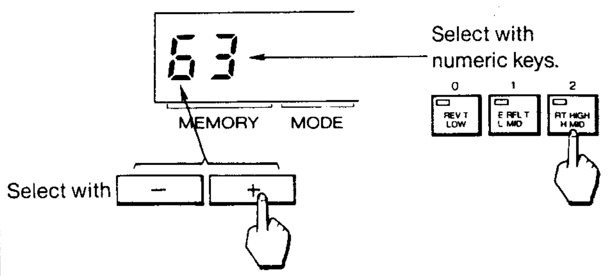
1 Press WRITE.


Lights
WRITE
Second digit flashes
03
MEMORY
MODE
CH
DATA

Number following the previously selected user memory is displayed.

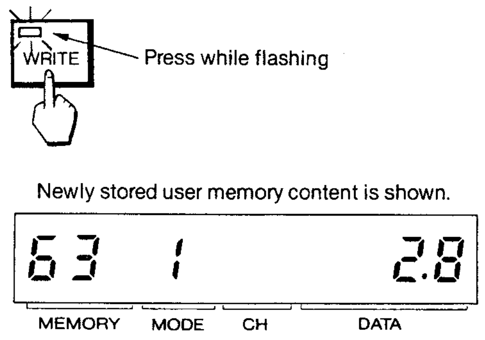
2 Select memory number with + and – and numeric keys.

For example, to write to memory number "63"


63
MEMORY
MODE
Select with numeric keys.
0
1
2
Select with
–
+

Indicator of WRITE button starts to flash.

3 Press WRITE once more.


WRITE
Press while flashing
63
1
2.8
MEMORY
MODE
CH
DATA

Newly stored user memory content is shown.

One-point advice
The WRITE function can be used to line up memory contents in the order required for use, for example, during a performance. When wishing to use "05", "18", "01", "32", "15" in that order, for example, you may use the numbers above 50 and proceed as follows.

1. Call up "05" and store in "50".
2. Call up "18" and store in "51".
3. Call up "01" and store in "52".
4. Call up "32" and store in "53".
5. Call up "15" and store in "54".

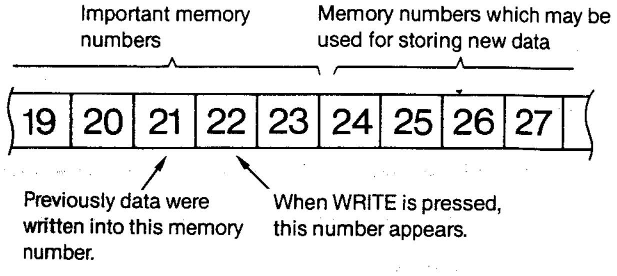
By starting with the memory number "50" and using the foot switch (connected to the MEMORY UP jack), you can easily call up the stored settings.

When the second digit of the memory number is selected
The indicator of the WRITE button flashes. In this condition, the memory number is not yet stored and may be changed.

When data are stored
The USER MEMORY function is activated with the new memory number.

Writable memory
You can modify the effect recalled from the PRESET MEMORY or USER MEMORY, and memorize it to the USER MEMORY. Note that you cannot write the effect into the PRESET MEMORY.

Note
When the WRITE button is pressed, the number that appears is always the one following the previous number used for storing data. Before using the new number, always make sure that it does not contain any data which you may want to keep, as these data will be erased (written over).


Important memory numbers
Memory numbers which may be used for storing new data
19
20
21
22
23
24
25
26
27
Previously data were written into this memory number.
When WRITE is pressed, this number appears.

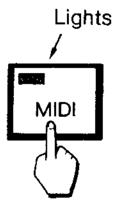
The contents stored in a user memory number should be noted in the User Memory Chart on page 46 for easy recall.

1-12. USING MIDI CONTROL (MIDI FUNCTION)

When MIDI program change signals and control change signals are used to control the MU-R201, the program contents can be changed as follows. The function of the parameter buttons is as shown by the yellow lettering.

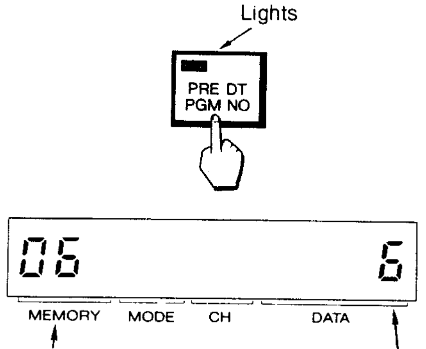
Checking and altering the memory number for a program.

1 **Press MIDI.**



The indicators of parameter buttons are flashing.

2 **Press PGM NO (to check the corresponding memory number).**

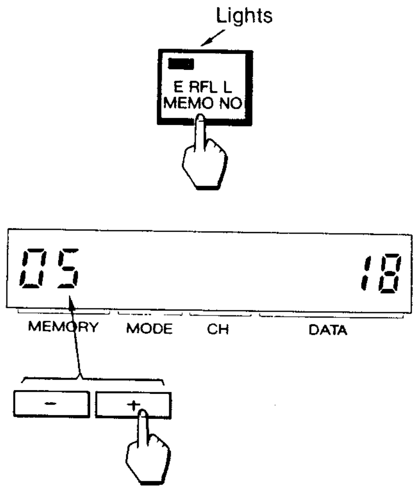


Memory number of MU-R201 corresponding to MIDI program number

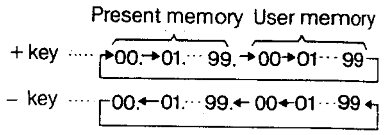
MIDI program number

When the program number is changed with the + and −, the corresponding memory numbers are shown.
When the MIDI program change signal is received, the received program number is displayed, which permits a check of corresponding numbers.

3 **Press the MEMO NO button (to change the corresponding memory number).**



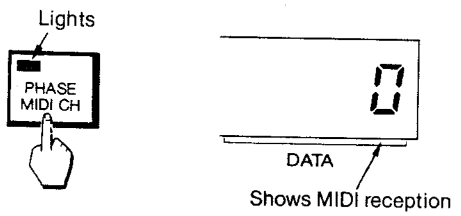
The corresponding memory number can be changed with + and −.



Selecting the MIDI reception channel

To be able to control the MU-R201 via the MIDI interface, the MIDI reception channel setting of the MU-R201 must match the MIDI transmission channel of the MIDI equipment.

Press the MIDI CH button.



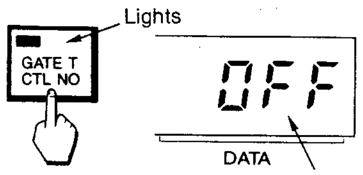
Shows MIDI reception channel.

MIDI reception channels from "0" to "16" can be selected.
- 0: OMNI ON (all channels from 1 to 16 are received).
- 1-16: OMNI OFF (only the selected channel is received)

Select the channel with the + and − keys.

Controlling the effect level

Press CTL NO.



Shows controlller number.

Use + and − to set the controller number (OFF, 1—124).
(The unit is factory preset to "OFF")

Controller number	Controller
OFF	Control disabled
1	Modulation wheel
2	Breath controller
4	Foot controller
5	Portament time
6	Data entry
7	Main volume
8	Balance control
10	Pan-pot
11	Expression
64	Damper pedal
65	Portament
66	Sostenuto
67	Soft pedal
96	Data increment
97	Data increment
122	Key velocity
123	Channel key pressure
124	Note number (for Note On only)

Numbers 122, 123, and 124 do not use the control change signal. For these numbers, the key velocity, channel key pressure, and note number signals are used to control the effect level.

Factory-set memory numbers

MIDI program number	Memory number of MU-R201
00—99	User memory 00—99
100—127	Preset memory 00.—27.

Repeating the memory number change

By repeating steps 2 and 3, the memory numbers corresponding to other program numbers can be changed. After all desired changes were made, set the unit to the MEMORY function.

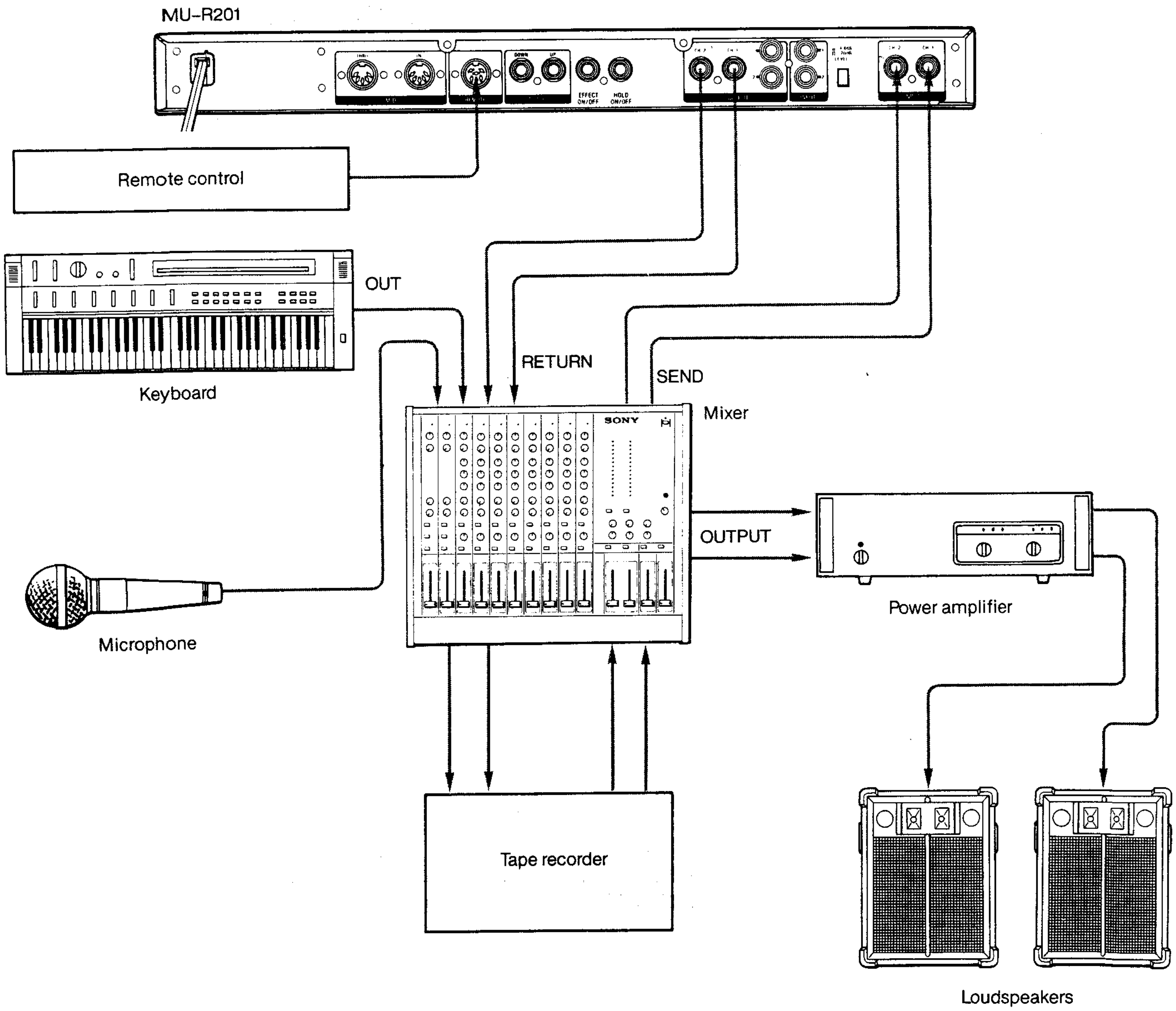
Note

Memory changes with the program change signal are possible only during use of the MEMORY function.
Effect level control with the control change signal is possible during use of all functions.
Some MIDI equipment may not be able to supply all signals. Refer to the instruction manual of the respective equipment for details.

1-13. CONNECTION EXAMPLES

CONNECTIONS FOR RECORDING

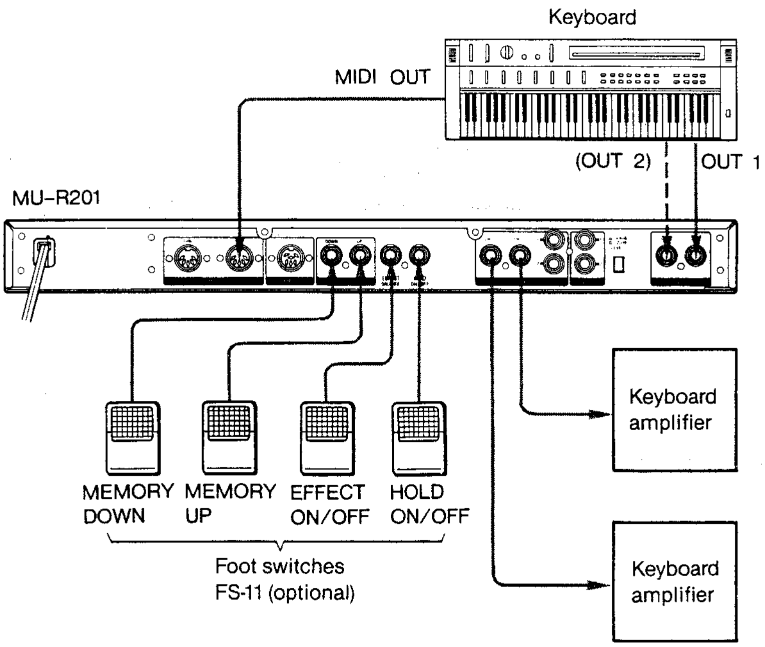
- The LEVEL switch should normally be set to +4 dB.
- The STEREO/MONO selector should normally be set to STEREO.


MU-R201
EFFECT ON/OFF
HOLD ON/OFF
Remote control
OUT
Keyboard
RETURN
SEND
SONY
Mixer
OUTPUT
Power amplifier
Microphone
Tape recorder
Loudspeakers

USE AS AN INSTRUMENT EFFECTER

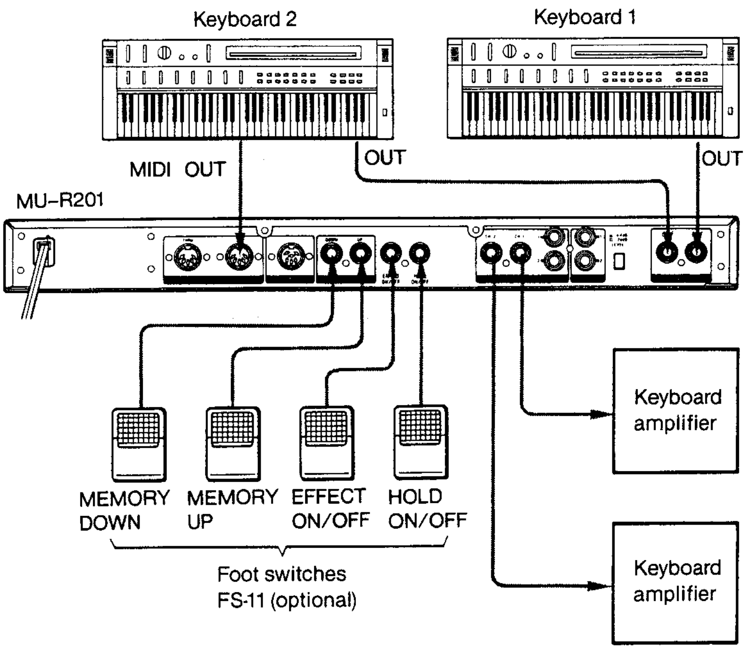
Mono/stereo input, stereo output example

- The LEVEL switch should normally be set to −20 dB.
- The STEREO/MONO selector should be set to MONO for mono input, or to STEREO for stereo input.


Keyboard
MIDI OUT
(OUT 2)
OUT 1
MU-R201
Keyboard amplifier
Keyboard amplifier
MEMORY DOWN
MEMORY UP
EFFECT ON/OFF
HOLD ON/OFF
Foot switches
FS-11 (optional)

Independent use of two channels

- The LEVEL switch should normally be set to −20 dB.
- The STEREO/MONO selector should be set to STEREO.

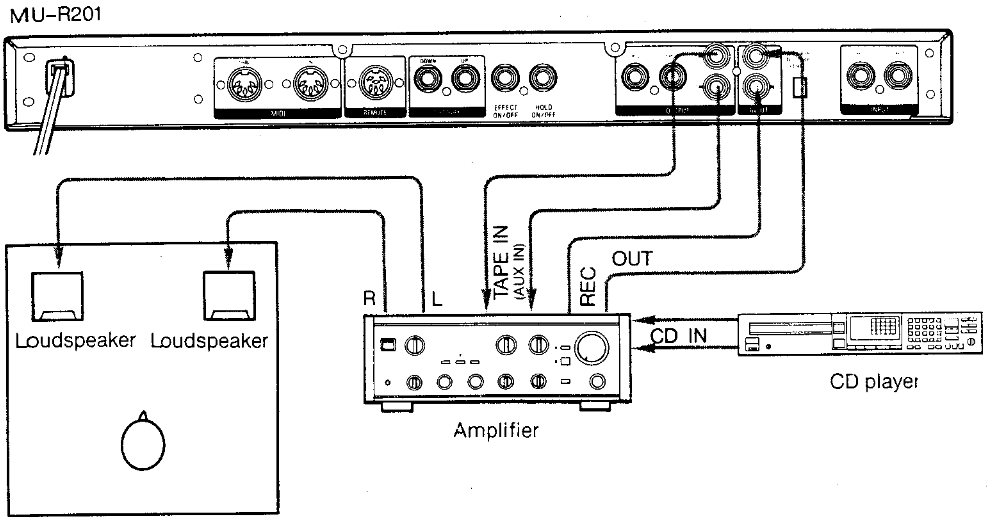

Keyboard 2
Keyboard 1
MIDI OUT
OUT
OUT
MU-R201
Keyboard amplifier
Keyboard amplifier
MEMORY DOWN
MEMORY UP
EFFECT ON/OFF
HOLD ON/OFF
Foot switches
FS-11 (optional)

CONNECTIONS WITH AN AUDIO SYSTEM

- The LEVEL switch should normally be set to – 20 dB.
- The STEREO/MONO selector should be set to STEREO.

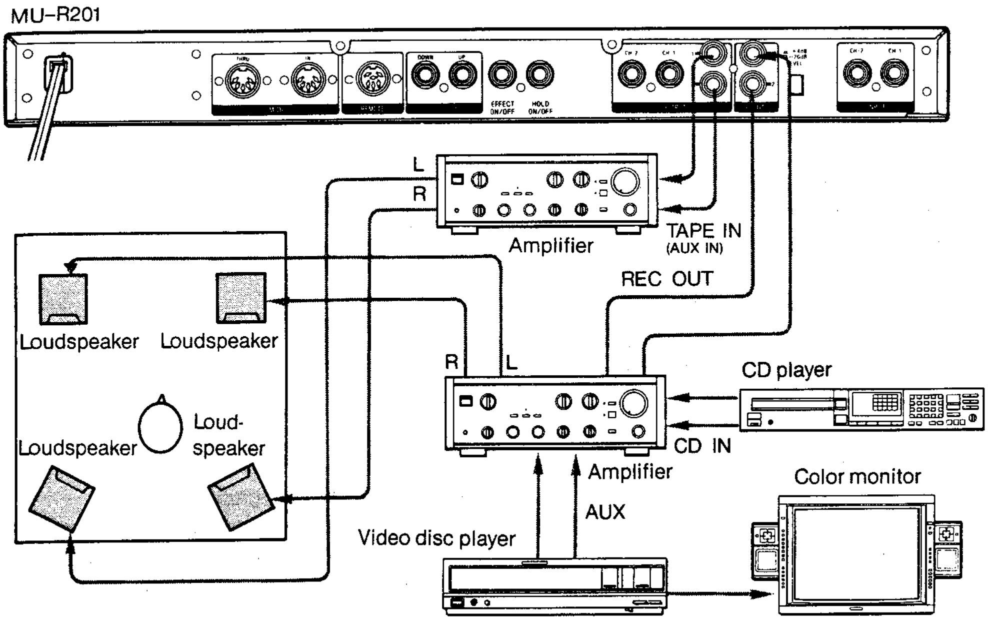
Conventional use

- Set the tape monitor switch of the amplifier to ON.

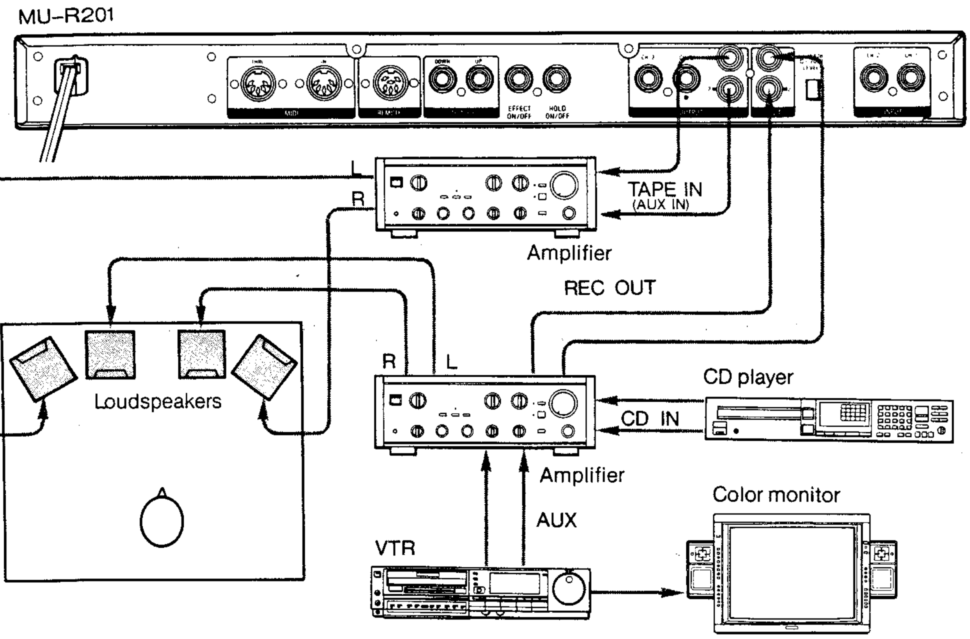

MU-R201
MIDI
REMOTE
EFFECT ON/OFF
HOLD ON/OFF
R
L
TAPE IN (AUX IN)
REC
OUT
CD IN
Loudspeaker
Loudspeaker
Amplifier
CD player

Use for surround sound

- Depending on the listening room, many different patterns are possible. Try for example the preset memory "21." (DRY should be set to 0.)


MU-R201
EFFECT ON/OFF
HOLD ON/OFF
L
R
Amplifier
TAPE IN (AUX IN)
REC OUT
Loudspeaker
Loudspeaker
Loudspeaker
Loud-speaker
R
L
CD player
CD IN
Amplifier
AUX
Color monitor
Video disc player

Use for increased sound presence


MU-R201
EFFECT ON/OFF
HOLD ON/OFF
L
R
TAPE IN
(AUX IN)
Amplifier
REC OUT
R
L
Loudspeakers
CD player
CD IN
Amplifier
Color monitor
AUX
VTR

To achieve a convincing presence effect

- The reflected sound should arrive at a suitable delay in comparison to the direct sound (about 10 to 30 ms).
- The reflected sound should arrive from a different direction than the direct sound.
- The reflected and the direct sound should have a suitable level difference (about 0 to −6 dB).

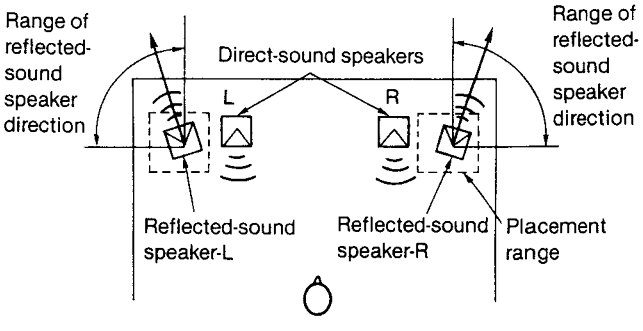
Loudspeaker placement and adjustment of the MU-R201

1 Set the DRY control to 0 (minimum).
2 Place the direct-sound (main) speakers at about 50 cm from the wall, facing forward.
3 Point the reflected-sound speakers towards the walls to the outside of the main speakers.
4 Play back some familiar material at a reasonable volume setting, through the main speakers only.
5 Play back the same material through the reflected-sound speakers only, and adjust the volume control of the amplifier to obtain about equal volume as in step (4).
6 Adjust the position and direction of the reflected-sound speakers so that the sound stage covers the entire wall.
7 Play back the material through both sets of speakers and adjust the E. RFL T to about 10 to 30 ms, paying attention to sound coherence and proper imaging.

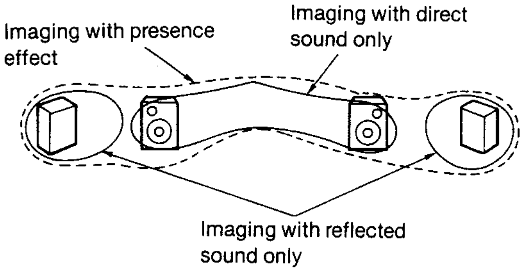
Basic presence effect

Mode No.	REV.T(s)	PRE.DT(ms)	E.REF.T(ms)	E.REF.L	RT HIGH	FBL	REPEAT	ED(dB)	EFF.L
5	1	0	20	0.992	0.99	.000	0	4	1.000
								2	
		0	20	0.992				0	
								0	

Speaker placement principles


Range of reflected-sound speaker direction
Direct-sound speakers
L
R
Range of reflected-sound speaker direction
Reflected-sound speaker-L
Reflected-sound speaker-R
Placement range

Imaging


Imaging with presence effect
Imaging with direct sound only
Imaging with reflected sound only

Choosing reflected-sound speakers

By selecting reflected-sound speakers with sound quality resembling that of the main speakers and with good bass reproduction capability, a natural and pleasing presence can be achieved.

1-14. PRESET MEMORY DATA CHART Memory numbers 00-19

The following descriptions and recommendations are intended only as a general guideline.
Many other uses of the MU-R201 are possible, limited only by your own imagination and creativity.

Application	Memory number	Program	Description
Standard patterns	00.	Hall	Simulated characteristics of famous, comparatively large concert halls are stored in this preset. Increase PRE. DT when wishing to increase the sense of depth, and adjust E. RFL. L. to change the size of the stage. The solid fundamentals of the hall can be further enhanced by boosting the LOW setting of the equalizer.
	01.	Room	A newly developed algorithm has made possible the creation of a small, dead space effect not available with conventional systems. To achieve a natural sound with this preset, set REV. T to about 0.3 to 1.0, and add some equalization.
	02.	Plate	The characteristics of plate reverberation, which is most commonly used in recording studios, have been faithfully simulated for this preset. By mixing in a suitable amount of sub reverb, a natural sound suited for many instruments is created. Sources with strong bass content or strings, which cause problems with conventional plate reverberation, are also handled effortlessly.
	03.	Gate Reverb	Gate reverb is most effective with dynamic percussive sounds such as kick drum or snares. By adjusting GATE T. to match the tempo or rhythm, a pleasing effect can be achieved. For this preset, all channels are set to the same value, resulting in averaging gate reverb.
	04.	Reverse Reverb	Reverse reverb, which previously could be produced only by playing a tape backwards, is now easily available with this preset. To create a striking effect, the GATE T parameter is set to a large and the REV. T to a small value. Adjusting PRE. DT and GATE to match the sound peaks is an important point.
	05.	Delay	The same effect as produced by two high-quality delay machines is stored in this preset. A strong effect is achieved by setting channel 1 to 500 ms and channel 2 to 1000 ms delay.
	06.	Flash Panning	This kind of effect previously required the simultaneous use of four delay machines and two autopan units. With the MU-R201, it is available at the simple push of a button. The preset is designed with the image of a comet shooting across the dark sky. It can lend a "space-like" quality to solo instruments.
	07.	Dual Reverb	Two plate reverberation effects with matched characteristics are stored in this preset. As sound quality is neutral and reverb time is long, the effect is suitable for all kinds of instruments. Adjust the DRY and EFFECT controls for optimum mixing.
	08.	Reverb & Gate	This preset permits the use of the MU-R201 as reverb and gate reverb unit. Channel 1 offers deep, uncolorated plate reverb, and channel 2 gate reverb suitable for snares or kick drum.
	09.	Reverb & Delay	Channel 1 contains plate reverb for impressive vocals, and channel 2 a delay effect suitable for slow, melodic instruments like strings or saxophone.
Recording, instrument use	10.	Large Hall	Simulation of a large space which lends suitable ambience to a full orchestra, chorus, etc. Characteristics are that of a well controlled hall.
	11.	Medieval Hall	A medium-size hall with fairly live characteristics, such as produced by stone or glass walls. Suitable for wind instruments.
	12.	Concert Hall	Recreates the characteristics of a medium-size hall for about 1000 people. Suitable for chamber music or a small orchestra.
	13.	Piano Hall	An intimate setting which enhances the bright, appealing sound of solo piano.
	14.	Chamber	A small hall for strings or chamber music.
	15.	Pipe Organ	This preset lends impressive presence and solidity to the pipe organ sound of a synthesizer.
	16.	Brass Solo	Simulates the sound of brass instruments such as trumpets in a medium-size hall.
	17.	Reggae	Special effect suitable for reggae trumpet solos, etc.
	18.	Shadow	By adjusting E. RFL T, the original sound seems to be followed by its shadow.
	19.	Pinball	This special effect may be used for round singing, etc. The reverberation moves from channel 2 to channel 1.

The parameter values for each preset are shown below.

MEMORY No.	PROGRAM	MODE	REV T	PRE DT	E RFL T	E RFL L	RT HIGH		SPREAD	EQ				EFF LEV
00.	Hall	0	3.2	67	47	0.500	0.46		12	4	4	0	2	0.500
				67	47	0.500				4	4	0	2	0.500
01.	Room	1	0.60	19	8	0.750	0.43		3	0	0	0	0	0.625
				19	8	0.750				0	0	0	0	0.625
02.	Plate	2	3.5	34	23	0.500	0.50		11	8	4	2	0	0.500
					23	0.500								
				34	23	0.351				8	4	2	0	0.500
					23	0.351								
03.	Gate Reverb	3	REV T	PRE DT	E RFL T	E RFL L	SPREAD		GATE T	EQ				EFF LEV
			50.0	20	1	0.992	5		130	8	4	8	0	0.875
					1	0.992	5							
				20	1	0.101	8			8	4	8	0	0.875
					1	0.101	8							
04.	Reverse Reverb	4	0.9	119	1	0.000	5		300	0	0	4	6	1.000
					1	0.000	5							
				119	1	0.000	5			0	0	4	6	1.000
					1	0.000	5							
05.	Delay	5	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	FBL	REPEAT	EQ				EFF LEV
			500	0	1	0.000	0.99	0.000	1	0	0	0	0	1.000
			1000	0	1	0.000	0.99	0.000	1	0	0	0	0	1.000
06.	Flash Panning	6	REV T	PRE DT	RT HIGH	FBL	DEPTH		SPEED	EQ				EFF LEV
			150	50	0.99	0.804	1.000		1.84	0	0	0	0	0.750
			200	80	0.99	0.500				0	0	0	0	0.750
07.	Dual Reverb	7	REV T	PRE DT	E RFL T	E RFL L	RT HIGH		SPREAD	EQ				EFF LEV
			3.78	67	23	0.500	0.46		16	0	0	0	0	0.625
					23	0.500								
			3.78	67	43	0.500	0.46			0	0	0	0	0.625
					43	0.500								
08.	Reverb & Gate (Cascade : off)	8	REV T	PRE DT	E RFL T	E RFL L	RT HIGH		SPREAD	EQ				EFF LEV
			2.70	67	23	0.500	0.46		16	6	2	0	−2	1.000
			REV T	PRE DT	E RFL T	E RFL L	SPREAD		GATE T	EQ				EFF LEV
			50.0	20	1	0.992	5		150	8	4	8	0	0.875
09.	Reverb & Delay (Cascade : off)	9	REV T	PRE DT	E RFL T	E RFL L	RT HIGH		SPREAD	EQ				EFF LEV
			2.22	47	13	0.500	0.46		16	−2	0	2	4	1.000
			REV T	PRE DT	E RFL T	E RFL L	RT HIGH	FBL	REPEAT	EQ				EFF LEV
			200	0	1	0.000	0.99	−0.406	1	−2	0	2	4	1.000
10.	Large Hall	0	REV T	PRE DT	E RFL T	E RFL L	RT HIGH		SPREAD	EQ				EFF LEV
			4.0	32	51	0.101	0.46		14	12	6	0	−4	0.500
				32	51	0.101				12	6	0	−4	0.500
11.	Medieval Hall	0	3.4	24	30	0.132	0.46		10	6	0	2	8	0.406
				24	30	0.132				6	0	2	8	0.406
12.	Concert Hall	0	2.2	12	28	0.500	0.62		16	10	−2	8	6	0.500
				12	14	0.500				10	−2	8	6	0.500
13.	Piano Hall	0	1.8	49	34	0.281	0.71		9	0	0	2	4	0.500
				49	27	0.281				0	0	2	4	0.500
14.	Chamber	0	2.7	119	97	0.375	0.59		9	−2	2	0	4	0.437
				153	132	0.375				−2	2	0	4	0.437
15.	Pipe Organ	0	3.0	81	50	0.484	0.60		15	8	4	2	2	0.500
				81	14	0.484				8	4	2	2	0.500
16.	Brass Solo	0	1.5	130	100	0.750	0.60		16	12	−6	10	8	0.625
				140	100	0.750				12	−6	10	8	0.625
17.	Reggae	0	3.0	281	51	0.101	0.60		12	12	4	0	12	0.500
				281	51	0.101				12	4	0	12	0.500
18.	Shadow	0	1.9	50	733	0.289	0.62		9	0	0	0	0	0.468
				50	732	0.273				0	0	0	0	0.468
19.	Pinball	0	2.6	700	100	0.375	0.60		9	4	2	2	4	0.437
				300	200	0.343				4	2	2	4	0.437

Memory numbers 20.–40.

Application	Memory number	Program	Description
Recording, instrument use	20.	Space Echo	Sound effect to simulate the wide, unlimited universe.
	21.	Compact Room	Simulation of a natural sounding, live interior. The effect is hardly noticeable, but it provides an important means to lend body and solidity to the sound, for example, of wood instruments or guitar. This technique is one of the secrets of professional engineers.
	22.	Powerful Drum	Especially suited for digital drums, drum compo servers, etc. Drastically improves the impact and musicality of kick drums.
	23.	Woodwinds	Lends a light and airy sound to woodwinds and wood percussion such as marimba, wood block, claves, etc. Especially suited for the relatively dry sounds produced with a synthesizer.
	24.	Live House (1)	Suitable to simulate reproduction of percussion, drums or synthesizer drums in a live-performance club with good acoustics.
	25.	Live House (2)	A somewhat larger club which is excellent for powerful drums, synthesizer drums, etc.
	26.	Vivid Snare	Useful for snares or kick drum. The slightly metallic sound will stand out and be clearly discernible also in an ensemble.
	27.	Piano Bar	Simulates the atmosphere of a small salon or lobby for solo piano or guitar. Use with a small ensemble is also effective to produce a mellow sound.
	28.	Baroque	Lends a festive mood to recorder, cembalo, string quartet performances, etc.
	29.	Trumpet	Suitable for brass instruments such as trumpet and trombone. The effect can also be used with a reduced level for reed instruments to improve sound depth.
	30.	Beat Sound	Rhythmic, danceable sounds from synthesizer drums or drum machine are enhanced by this metallic effect.
	31.	Snare	An effect commonly used for snare drums. By boosting LOW and L MID of the equalizer and reducing the RT HIGH setting, a deep, clear-cut snare sound can be produced.
	32.	Clear Reverb	This highly intricate reverberation is achieved by a complex combination of pre-delay and early reflections. Using this effect increases depth without blurring the sound image.
	33.	Electric Guitar Distortion	Increases the drive of a lead guitar with distortion. Original sound character can be produced by adding equalization, especially in the MID and HIGH range.
	34.	Flute	Lends depth to instruments such as flute and alto recorder, bamboo flute, etc.
	35.	Lyric Piano	Suitable for slow jazz ballads or medium-tempo popular numbers, using plate reverberation for hall ambience.
	36.	Mystic Strings	Increases the spread of strings, synthesizer, harp, etc., with a mystical effect. Suitable for slow numbers, ballads, etc.
	37.	Cathedral	Music such as Gregorian chants and chorus vocals can be enhanced with this effect.
	38.	Guitar Reverb	Powerful reverberation of a similar impact as twin reverb. Suitable for electric guitar.
	39.	Polyrhythm	By using this effect with percussive sounds produced with a synthesizer or drum machine, a revolving reverberation with a large pre-delay (440 ms) is achieved. Create polyrhythms by matching the PRE DT timing to the tempo of the music.
	40.	Rock Vocal	Suitable for dazzling male or female vocal performances.

MEMORY No.	PROGRAM	MODE	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	SPREAD	EQ				EFF LEV
20.	Space Echo	0	99.0	100	51	0.375	0.40	12	4	4	0	2	0.375
				100	51	0.375			4	4	0	2	0.375
21.	Compact Room	1	0.30	11	7	0.992	0.99	2	12	0	6	4	0.406
				13	4	0.992			12	0	6	4	0.406
22.	Powerful Drum	1	0.37	23	8	0.500	0.33	3	8	6	10	10	0.406
				23	8	0.500			8	6	10	10	0.406
23.	Woodwinds	1	0.57	21	9	0.500	0.73	4	0	0	2	0	0.500
				21	9	0.500			0	0	2	0	0.500
24.	Live House (1)	1	0.75	15	10	0.843	0.50	2	-12	-4	12	-8	0.484
				15	10	0.843			-12	-4	12	-8	0.484
25.	Live House (2)	1	0.77	23	11	0.523	0.49	3	12	4	0	-2	0.468
				23	11	0.523			12	4	0	-2	0.468
26.	Vivid Snare	1	1.07	18	6	0.500	0.70	4	0	0	0	0	0.406
				18	6	0.500			0	0	0	0	0.406
27.	Piano Bar	1	1.02	35	8	0.500	0.89	3	-12	2	8	12	0.437
				51	8	0.500			-12	2	8	12	0.437
28.	Baroque	1	0.80	12	103	0.984	0.45	2	4	-2	-2	4	0.484
				12	103	0.984			4	-2	-2	4	0.484
29.	Trumpet	1	0.67	72	11	0.476	0.46	2	2	-2	4	-2	0.531
				67	8	0.445			2	-2	4	-2	0.531
30.	Beat Sound	1	0.70	1	1	0.000	0.01	11	12	-2	2	2	0.500
				71	1	0.000			12	-2	2	2	0.500
31.	Snare	2	1.7	37	38	0.523	0.47	8	-2	0	2	2	0.875
					39	0.523							
				33	31	0.406			-2	0	2	2	0.875
					31	0.406							
32.	Clear Reverb	2	1.7	34	25	0.500	0.87	11	0	10	2	-10	0.625
					23	0.500							
				34	113	0.335			0	10	2	-10	0.625
					174	0.335							
33.	Electric Guitar Distortion	2	2.4	47	39	0.523	0.60	10	6	2	-4	-4	0.750
					37	0.523							
				51	23	0.351			6	2	-4	-4	0.750
					23	0.351							
34.	Flute	2	0.8	94	44	0.234	0.99	15	8	8	-8	-4	0.750
					45	0.265							
				87	43	0.242			8	8	-8	-4	0.750
					39	0.265							
35.	Lyric Piano	2	3.2	83	11	0.500	0.71	13	8	4	2	0	0.500
					13	0.500							
				83	74	0.476			8	4	2	0	0.500
					74	0.476							
36.	Mystic Strings	2	4.2	40	23	0.500	0.50	12	4	4	8	8	0.500
					23	0.500							
				40	23	0.500			4	4	8	8	0.500
					23	0.500							
37.	Cathedral	2	6.3	23	23	0.500	0.85	15	4	2	0	0	0.500
					23	0.500							
				23	103	0.507			4	2	0	0	0.500
					103	0.507							
38.	Guitar Reverb	2	1.6	21	50	0.500	0.50	1	0	0	8	8	0.875
					50	0.500							
				21	23	0.250			0	0	8	8	0.875
					23	0.250							
39.	Poly Rhythm	2	2.5	440	50	0.500	0.50	1	0	0	8	8	0.500
					50	0.500							
				440	23	0.250			0	0	8	8	0.500
					23	0.250							
40.	Rock Vocal	2	1.8	273	71	0.992	0.37	16	-4	4	12	6	0.875
					71	0.992							
				273	273	0.312			-4	4	12	6	0.875
					273	0.414							

Memory numbers 41.–60.

Application	Memory number	Program	Description
Recording, instrument use	41.	Vibrato	By using this effect for solo string or reed instruments with vibrato, reverberation with clear sound imaging is achieved. For best results, the effect should be used with moderation.
	42.	Sharp Snare	Sharp gate reverb for snares or tom tom.
	43.	Tom Beat	This effect is suitable for repeated percussion sounds. GATE T must be carefully adjusted, for good phrase and gate matching.
	44.	Kick Gate	Normal gate for use with kick drums. GATE T must be adjusted to match the tempo.
	45.	Fancy Kick	A new kind of gate reverb for kick drums. Interesting effects can be accomplished for example with 16-beat rhythm patterns.
	46.	Slip Gate	Gate reverb with the sound moving from right to left. Using it for short drum solos produces striking effects.
	47.	Heavy Reverse	Short reverse reverb suitable for all kinds of drums. May be inserted for example in the middle of a selection.
	48.	Reverse Slip	Special reverse reverb moving from left to right.
	49.	Scratch Reverse	Reverse reverb with final attack. Suitable for tom tom and congas, etc.
	50.	Single Tapped Delay	Use for synthesizer or percussion. Channel 1 has a delay of 173 ms+440 ms=613 ms, and channel 2 a delay of 440 ms with a slight high-cut filter.
	51.	Twin Delay	Permits use of the MU-R201 as two regular delay machines. Attenuation is adjusted with FBL and RT HIGH. By setting FBL to 0.500 and RT HIGH to 0.99, the sound is attenuated by half each period.
	52.	Tapped Delay	With this feedback delay, the level increases until the number of selected repeats is reached, and then decays. In channel 2 only, pre-delay is used, which causes the sound to oscillate between left and right.
	53.	Flying Delay	The sound seem to drift back and forth in the air and then decays slowly. Suitable for ballads, etc.
	54.	Panning Delay	This preset simulates the panning of a distinct sound source, with different rhythm effects in the two channels. Creates special effects with synthesizer or percussion.
	55.	Shadow Rhythm	Using this preset at tempo 120 or 60 with high-hat or snares creates interesting polyrhythms. When changing the tempo, PRE. DT must be adjusted. For tempo 150 and 4-beat material, the beat occurs once every 400 ms (60 ÷ 150), and for 8-beat once every 200 ms. Therefore PRE. DT should be set to 200 (ms). The effect should be fed to one channel only.
	56.	Rose Piano	Suitable for electric piano with vibrato. The same signal should not be fed to both channels.
	57.	Auto Panning	The sound is automatically panned between the two channels. By increasing the speed, a tremolo effect with the sound virtually vibrating in the air can be achieved. One panning cycle is set to 5 seconds. Turn down the DRY control to check the effect. The same signal should not be fed to both channels.
	58.	Tremolo	Adjust the SPEED to produce vibrato for continuous sounds such as organ or strings. The same signal should not be fed to both channels.
	59.	Twin Plate	Two plate reverbs with perfectly matched characteristics. A powerful sound impression is created by slightly boosting L MID with the equalizer.
	60.	Tom Tom	Effective dual reverb. Using channel 1 for high tom tom and channel 2 for low tom tom can serve to produce distinctive results.

MEMORY No.	PROGRAM	MODE	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	SPREAD	EQ				EFF LEV
41.	Vibrato	2	2.6	571	133	0.992	0.87	11	0	10	2	−4	0.500
					127	0.992							
				424	197	0.992			0	10	2	−4	0.500
					197	0.992							

MEMORY No.	PROGRAM	MODE	REV T	PRE DT	E RFL T	E RFL L	SPREAD	GATE T	EQ				EFF LEV
42.	Sharp Snare	3	10.0	20	20	0.992	3	120	4	2	8	−2	0.750
					20	0.992	3						
				20	54	0.992	6		4	2	8	−2	0.750
					54	0.992	6						
43.	Tom Beat	3	2.6	10	10	0.500	6	100	0	0	0	0	1.000
					10	0.500	6						
				10	10	0.500	8		0	0	0	0	1.000
					10	0.500	8						
44.	Kick Gate	3	2.0	1	1	0.992	6	163	12	4	0	−10	0.875
					1	0.992	6						
				1	1	0.000	8		12	4	0	−10	0.875
					1	0.000	8						
45.	Fancy Kick	3	50.0	90	174	0.343	6	1	0	0	0	0	1.000
					174	0.343	6						
				90	1	0.000	9		0	0	0	0	1.000
					1	0.000	9						
46.	Slip Gate	3	50.0	120	1	0.992	6	220	8	4	8	0	0.625
					1	0.992	6						
				20	50	0.085	8		8	4	8	0	0.625
					50	0.085	8						
47.	Heavy Reverse	4	1.1	60	4	0.500	6	111	0	−2	−2	8	1.000
					4	0.500	6						
				60	4	0.500	16		0	−2	−2	8	1.000
					4	0.500	16						
48.	Reverse Slip	4	4.0	120	1	0.000	6	175	0	−2	−2	8	0.875
					1	0.000	6						
				240	1	0.000	8		0	−2	−2	8	0.875
					1	0.000	8						
49.	Scratch Reverse	4	91.0	1	201	0.992	3	170	4	0	4	4	0.875
					201	0.992	3						
				1	1	0.000	6		4	0	4	4	0.875
					1	0.000	6						

MEMORY No.	PROGRAM	MODE	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	FBL	REPEAT	EQ				EFF LEV
50.	Single Tapped Delay	5	440	173	1	0.000	0.56	0.000	1	6	−4	12	−2	1.000
			440	0	1	0.000	0.56	0.000	1	6	−4	12	−2	1.000
51.	Twin Delay	5	350	0	1	0.000	0.50	0.304	1	6	−4	12	−2	0.875
			350	0	1	0.000	0.50	0.304	1	6	−4	12	−2	0.875
52.	Tapped Delay	5	410	0	255	0.750	0.90	0.500	2	0	0	0	0	0.875
			410	255	255	0.750	0.90	0.500	2	0	0	0	0	0.875
53.	Flying Delay	5	250	173	1	0.000	0.50	0.539	4	6	−4	12	−2	1.000
			250	0	1	0.000	0.50	0.359	3	6	−4	12	−2	1.000
54.	Panning Delay	5	381	127	1	0.000	0.99	0.000	2	0	0	0	0	1.000
			381	254	254	0.992	0.99	0.000	2	0	0	0	0	1.000

MEMORY No.	PROGRAM	MODE	REV T	PRE DT	RT HIGH	FBL	DEPTH	SPEED	EQ				EFF LEV
55.	Shadow Rhythm	6	1	250	0.99	0.000	1.000	20.00	0	2	6	2	0.750
			1	250	0.99	0.000			0	2	6	2	0.750
56.	Rose Piano	6	1	201	0.99	0.000	0.679	2.00	0	2	6	2	0.750
			1	201	0.99	0.000			0	2	6	2	0.750
57.	Auto Panning	6	0	0	0.99	0.000	1.000	0.20	0	2	6	2	1.000
			0	0	0.99	0.000			0	2	6	2	1.000
58.	Tremolo	6	0	0	0.99	0.000	1.000	7.50	4	2	2	0	1.000
			0	0	0.99	0.000			4	2	2	0	1.000

MEMORY No.	PROGRAM	MODE	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	SPREAD	EQ				EFF LEV
59.	Twin Plate	7	2.10	10	10	0.500	0.48	16	4	2	0	0	0.500
					10	0.500							
			2.10	10	45	0.500	0.48		4	2	0	0	0.500
					45	0.500							
60.	Tom Tom	7	4.02	51	20	0.500	0.08	9	8	0	6	0	0.750
					20	0.500							
			2.46	51	43	0.500	0.27		8	0	6	0	0.750
					43	0.500							

Memory numbers 61.–79.

Application	Memory number	Program	Description
Recording, instrument use	61.	Ethnic Drum	Lends raw impact and low-end solidity to tom toms, etc. Low frequencies have a long reverberation time in channel 1, and high frequencies in channel 2.
	62.	Cliffverb	Advanced technique which adds a slight reverb just before the gate cut-off action. Input to channel 1 and use the output of channel 2.
	63.	Solo Guitar & Metal Gate	Channel 1 provides reverb for solo guitar with clear initial attack, and channel 2 offers rough gate reverb for highly metallic percussion sounds.
	64.	Special Beat	Strong effect to emphasize a special percussion part within a selection. Input to channel 1 and use the output of channel 2.
PA (SR) use	65.	Standard Vocal	**Use of reverb on location for PA (SR) purposes** In recent years, reverberation is widely used in PA equipment for concerts and other events. About three or four reverberators are often employed in a typical installation. Especially for open-air concerts, reverberators are a vital part of the equipment. However, problems often occur due to acoustic feedback, as the sound chain extends from microphone to speakers to hall echo and back to the microphone. Long reverberation times in particular can easily cause feedback. Reverberation should therefore be used with judgment, for example to enhance the impact and spaciousness of vocals while avoiding excessive effects. The MU-R201 provides ten PA presets which were determined through actual use in the field. However, as each stage and location is different, further adjustment may be required to achieve optimum results. 65.: Standard setting with hall mode for most vocals. 66.: Suitable for upbeat rock vocals. 67., 68.: Lends depth to slow-moving ballads. 69.: Increases the sound depth with male vocals in small locations. 70.: Suitable for vocals in large outdoor settings. 71.: Use sparingly to enhance spaciousness of female vocals. 72.: Adds sparkle to female vocals. 73.: Suitable for female vocal ballads. 74.: Adds a cosmic sound to synthesizer solos.
	66.	Rock Vocal	
	67.	Ballad (1)	
	68.	Ballad (2)	
	69.	Male Vocal (1)	
	70.	Male Vocal (2)	
	71.	Female Vocal (1)	
	72.	Female Vocal (2)	
	73.	Female Vocal Ballad	
	74.	Solo synthesizer	
Special effects	75.	Tunnel	Simulates a tunnel. This effect can be used for example in this way: Set DRY to minimum and EFFECT to maximum. Then slowly increase the DRY level and decrease the EFFECT level. The sound now seems to be moving out of the tunnel and approaching the listener. Reverse operation is also possible.
	76.	Stadium	Simulation of announcements at a large stadium. By setting PRE. DT to a low value and slightly increasing RT HIGH, the atmosphere of a school yard can be created.
	77.	Gymnasium	Simulates the fairly live sound of a sports gymnasium or auditorium with wooden floors and walls. To emulate this location filled with people, decrease RT HIGH. The balance of DRY and EFFECT controls the distance to the sound source. Increasing DRY brings it closer to the listener.
	78.	Indoor Pool	Simulates an indoor location with a large water surface. By controlling SPREAD and PRE. DT, the effect can be brought to resemble a bathroom, for example to simulate singing in a bathtub. By decreasing DRY and increasing EFFECT with the pool setting, the listener seems to be seated in the spectator area.
	79.	Radio Play	Radio shows mostly recorded close-miked, which can cause them to sound unnatural. This effect improves reality by restoring the impression of regular indoor speaking.

MEMORY No.	PROGRAM	MODE	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	SPREAD	EQ				EFF LEV
61.	Ethnic Drum	7	4.50	50	10	0.500	0.08	3	0	0	0	0	0.750
					10	0.500							
			2.10	50	43	0.500	0.27		0	0	0	0	0.750
					43	0.500							
62.	Cliffverb (Cascade : 1–2)	8	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	SPREAD	EQ				EFF LEV
			3.54	83	10	0.500	0.43	16	4	6	0	0	0.750
			REV T	PRE DT	E RFL T	E RFL L	SPREAD	GATE T	EQ				EFF LEV
			10.0	30	23	0.500	6	17	4	6	0	0	0.500
63.	Solo Guitar & Metal Gate (Cascade : Off)	8	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	SPREAD	EQ				EFF LEV
			1.62	100	100	0.500	0.37	13	−2	0	2	4	1.000
			REV T	PRE DT	E RFL T	E RFL L	SPREAD	GATE T	EQ				EFF LEV
			50.0	25	20	0.992	1	80	12	12	6	0	1.000
64.	Special Beat (Cascade: 1 – 2)	9	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	SPREAD	EQ				EFF LEV
			2.82	110	40	0.500	0.55	14	−2	0	2	4	0.875
			REV T	PRE DT	E RFL T	E RFL L	RT HIGH FBL	REPEAT	EQ				EFF LEV
			300	0	1	0	0.50 0.500	1	−2	0	2	4	0.875
65.	Vocal Standard	0	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	SPREAD	EQ				EFF LEV
			2.8	80	86	0.500	0.68	12	−2	0	2	6	0.500
				105	86	0.500			−2	0	2	6	0.500
66.	Rock Vocal	2	3.0	75	63	0.804	0.28	10	−2	2	0	4	0.500
					63	0.804							
				95	255	0.375			−2	2	0	4	0.500
					255	0.375							
67.	Ballad (1)	0	3.0	78	120	0.640	0.75	12	−2	0	2	6	0.500
				150	120	0.640			−2	0	2	6	0.500
68.	Ballad (2)	2	3.6	106	47	0.500	0.60	15	0	0	2	6	0.500
					29	0.500							
				106	245	0.296			0	0	2	6	0.500
					256	0.296							
69.	Male Vocal (1)	0	4.0	62	30	0.132	0.46	9	0	0	2	2	0.500
				62	30	0.132			0	0	2	2	0.500
70.	Male Vocal (2)	2	2.8	85	45	0.585	0.75	12	−4	−2	2	6	0.500
					45	0.585							
				85	45	0.585			−4	−2	2	6	0.500
					45	0.585							
71.	Female Vocal (1)	0	5.2	87	51	0.101	0.28	15	−2	2	2	4	0.406
				87	51	0.101			−2	2	2	4	0.406
72.	Female Vocal (2)	0	3.3	1	51	0.101	0.52	12	−2	2	2	8	0.445
				1	51	0.101			−2	2	2	8	0.445
73.	Female Ballad	2	3.5	12	120	0.218	0.68	16	8	6	2	0	0.500
					120	0.218							
				12	208	0.226			8	6	2	0	0.500
					208	0.226							
74.	Solo Synthesizer	0	3.4	24	30	0.132	0.46	9	6	0	2	8	0.539
				24	30	0.132			6	0	2	8	0.539
75.	Tunnel	2	2.5	178	50	0.500	0.45	11	8	4	2	0	0.500
					50	0.500							
				343	23	0.351			8	4	2	0	0.500
					23	0.351							
76.	Stadium	2	1.7	247	72	0.945	0.65	11	8	2	0	−8	0.875
					72	0.945							
				247	733	0.156			8	2	0	−8	0.875
					370	0.453							
77.	Gymnasium	2	2.0	342	133	0.992	0.87	11	0	10	2	−4	0.500
					127	0.992							
				424	197	0.992			0	10	2	−4	0.500
					197	0.992							
78.	Indoor Pool	2	3.5	87	27	0.500	0.97	11	0	10	2	−10	0.500
					27	0.500							
				87	63	0.250			0	10	2	−10	0.500
					63	0.250							
79.	Radio Play	1	0.57	21	9	0.500	0.73	2	6	2	2	0	0.500
				21	9	0.500			6	2	2	0	0.500

Memory numbers 80.–99.

Application	Memory number	Program	Description
Special effects	80.	Mecha-Voice	Creates the image of robot or synthesized voices. Decreasing REV. T (delay time) increases the pitch and vice versa.
	81.	Cave	Simulates the sound of a comparatively small cave. The consistence of walls (rock, earth) and size of the cave can be adjusted with REV. T, E. RFL. T and RT HIGH.
	82.	Mountain Echo	Creates an echo as heard deep in the mountains. The shape and appearance of mountains and valleys can be influenced with REV. T. Increase the value for rocky surroundings and decrease it for an impression of wooded areas. The feel of the echo itself should be adjusted with the number of repeats and the feedback level.
	83.	Karaoke (1)	This echo is designed for normal sing-along (karaoke) vocals in slow tempo. Higher tempos can be matched by decreasing REV. T and FBL. Female vocals can often be enhanced by boosting the LOW setting of the equalizer.
	84.	Karaoke (2)	Plate reverb for sing-along use. Suitable for popular numbers. Adjusting EQ as in 83. can further improve results.
Audio use	85.	American Large Hall (1)	Five different patterns gained by analyzing renowned concert halls all over the world are stored in these presets, for BGM or audio use. When applied to BGM, these effects create a soothing, unobtrusive sound which is suitable also for conferences, etc. If the volume is lowered, increasing EFFECT restores a natural balance. For audio applications, tapes, records or CDs can be enhanced with a rich feeling of presence. As some records and CDs are already pre-processed, the MU-R201 should be used in moderation. 85.: Sparkling, bright ambience such as found in the Boston Symphony Hall. 86.: Ambience with long reverberation times for low frequencies, such as in Carnegie Hall. 87.: Well-balanced, high-quality ambience as in the Musikverein-Saal of Vienna. 88.: Hall with a delicate high end and rich mid and low frequency reverberation. 89.: Concert hall suited for solo instrument recitals.
	86.	American Large Hall (2)	
	87.	European Large Hall (1)	
	88.	European Large Hall (2)	
	89.	European Recital Hall	
	90.	Orchestra (1)	Suitable for reproduction of orchestra recordings of symphonies, etc. Preset 90. simulates a front row seat on the ground floor and preset 91. a front row seat in the balcony.
	91.	Orchestra (2)	
	92.	Chamber Music (1)	These presets are designed for small and medium size chamber music ensembles. Preset 92. simulates a front row seat in a medium hall and preset 93. a first row seat in a small hall.
	93.	Chamber Music (2)	
	94.	Opera (1)	These presets simulate a large opera house. Preset 94. simulates a front row seat in the balcony of a medium size hall and preset 95. a front row seat on the ground floor.
	95.	Opera (2)	
	96.	Jazz (1)	These presets simulate a live jazz or fusion music performance. Preset 96. emulates an outdoor concert and preset 97. an indoor concert with PA equipment.
	97.	Jazz (2)	
	98.	Rock (1)	These presets are designed for rock recordings. To recreate the feeling of a live performance, the time factors of the reflected sound and the tone balance were modified.
	99.	Rock (2)	

Note

The presets of memory numbers 90. through 99. are designed for output to sub speakers (reflected-sound speakers) used to create a presence effect. (For details, refer to page 34.)

MEMORY No.	PROGRAM	MODE	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	FBL	REPEAT	EQ				EFF LEV
80.	Mecha-Voice	5	7	19	1	0.000	0.99	0.507	5	2	2	8	−2	0.500
			7	19	1	0.000	0.99	0.804	5	2	2	8	−2	0.500
81.	Cave	7	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	SPREAD		EQ				EFF LEV
			1.38	53	63	0.820	0.12	10		10	4	−4	−8	0.750
					63	0.820								
			1.38	127	7	0.796	0.12			10	4	−4	−8	0.750
					7	0.796								
82.	Mountain Echo (Cascade: 1 − 2)	9	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	SPREAD		EQ				EFF LEV
			1.38	62	1	0.476	0.50	14		6	2	0	0	0.750
			REV T	PRE DT	E RFL T	E RFL L	RT HIGH	FBL	REPEAT	EQ				EFF LEV
			1001	0	1	0.992	0.43	0.195	1	6	2	0	0	0.750
83.	Karaoke (1)	5	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	FBL	REPEAT	EQ				EFF LEV
			130	0	1	0.000	0.70	0.578	1	2	6	12	4	0.500
			130	0	1	0.000	0.70	0.576	1	2	6	12	4	0.500
84.	Karaoke (2)	2	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	SPREAD		EQ				EFF LEV
			2.5	34	23	0.500	0.83	11		0	10	2	−10	0.500
					23	0.500								
				34	113	0.250				0	10	2	−10	0.500
					174	0.250								
85.	American Large Hall (1)	0	2.0	26	13	0.656	0.66	16		2	0	0	0	0.484
				23	13	0.656				2	0	0	0	0.468
86.	American Large Hall (2)	0	2.8	29	21	0.781	0.27	16		6	0	0	−2	0.500
				32	21	0.781				6	0	0	−2	0.500
87.	European Large Hall (1)	0	2.4	15	17	0.476	0.48	13		4	2	0	0	0.500
				12	17	0.476				4	2	0	0	0.500
88.	European Large Hall (2)	0	2.1	17	18	0.632	0.44	13		8	2	0	−4	0.500
				17	18	0.632				8	2	0	−4	0.500
89.	European Recital Hall	0	1.5	37	17	0.750	0.33	11		2	2	2	−2	0.500
				37	17	0.750				2	2	2	−2	0.500
90.	Orchestra (1)	5	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	FBL	REPEAT	EQ				EFF LEV
			1	0	25	0.882	0.99	0.000	0	4	4	4	0	1.000
			1	0	25	0.882	0.99	0.000	0	4	4	4	0	1.000
91.	Orchestra (2)	0	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	SPREAD		EQ				EFF LEV
			1.2	20	15	0.992	0.46	12		4	4	2	0	0.546
				20	15	0.992				4	4	2	0	0.546
92.	Chamber Music (1)	0	1.2	20	15	0.992	0.76	14		6	4	2	0	0.578
				20	15	0.992				6	4	2	0	0.578
93.	Chamber Music (2)	0	0.3	20	15	0.992	0.76	8		6	4	6	0	0.804
				20	15	0.992				6	4	6	0	0.804
94.	Opera (1)	1	0.60	25	13	0.992	0.50	13		4	0	0	0	0.750
				25	13	0.992				4	0	0	0	0.750
95.	Opera (2)	1	0.60	25	13	0.992	0.50	3		4	2	0	0	0.750
				25	13	0.992				4	2	0	0	0.750
96.	Jazz (1)	1	0.35	25	13	0.992	0.50	2		4	4	2	2	0.843
				25	13	0.992				4	4	2	2	0.843
97.	Jazz (2)	1	0.40	23	16	0.992	0.80	6		6	6	4	0	0.843
				23	16	0.992				6	6	4	0	0.843
98.	Rock (1)	5	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	FBL	REPEAT	EQ				EFF LEV
			1	0	16	0.781	0.99	0.000	0	10	6	0	0	1.000
			1	0	16	0.781	0.99	0.000	0	10	6	0	0	1.000
99.	Rock (2)	2	REV T	PRE DT	E RFL T	E RFL L	RT HIGH	SPREAD		EQ				EFF LEV
			0.8	26	14	0.906	0.50	4		4	2	4	2	0.570
					14	0.906								
				26	20	0.992				4	2	4	2	0.570
					20	0.992								

1-15. MIDI IMPLEMENTATION CHART

When using the MIDI function for data transfer between other equipment and the MU-R201, the data format must conform to the conditions shown below and in the implementation chart on the next page.
(The MU-R201 can send data only from the REMOTE terminal.)

MIDI data format

Channel voice message

• 1100 nnnn	Program change & channel number (nnnn=0—15)
0ppp pppp	Program number (ppppppp=0—127)
• 1011 nnnn	Control change & channel number (nnnn=0—15)
0ccc cccc	Control number (ccccccc=0—121)
0vvv vvvv	Control value (vvvvvvv=0—127)
• 1001 nnnn	Note On & channel number (nnnn=0—15)
0kkk kkkk	Note number (kkkkkkk=0—127)
0vvv vvvv	Note On velocity (vvvvvvv=0—127)
• 1101 nnnn	Channel pressure (After-touch) & channel number (nnnn=0—15)
0vvv vvvv	Pressure value (vvvvvvv=0—127)

Channel mode message

• 1011 nnnn	Mode messages & channel number (nnnn=0—15)	
0ccc cccc	Omni mode Off	Omni mode On
	ccccccc=124	ccccccc=125
0vvv vvvv	vvvvvvv=0	vvvvvvv=0

System real time message

• 1111 1111	System reset

System exclusive message

• 1111 0000 (F0)	Status
0100 1100 (4c)	ID•No
0ccc cccc	Command
0ddd dddd ⋮ 0ddd dddd	Data
1111 0111 (F7)	EOX

	Command	Data
Key code transfer (receive)	0000 0000	0nkk kkkk key data (kkkkkk = 0—63, n = 0 key Off data, n = 1 key On data)
Start address transfer (receive)	0010 0000	0000 aaaa 0000 aaaa 0000 aaaa 0000 aaaa 3210 7654 BA98 FEDC aaaa aaaa aaaa aaaa Start address FEDC BA98 7654 3210
Data transfer (send/receive)	0100 0000	0000 aaaa 0000 aaaa 0000 aaaa 0000 aaaa 0000 dddd 0000 dddd ··· 3210 7654 BA98 FEDC 3210 7654 aaaa aaaa aaaa aaaa Start of transfer address FEDC BA98 7654 3210 dddd dddd Transfer data 7654 3210
Display transfer (send)	0111 0000	0000 dddd 0000 dddd ··················· 3210 7654 dddd dddd Display data 7654 3210
Request all display data (receive)	0111 0001	
System check (send)	0111 1111	0000 dddd 0000 dddd 3210 7654 dddd dddd System check data 7654 3210

MIDI Implementation Chart

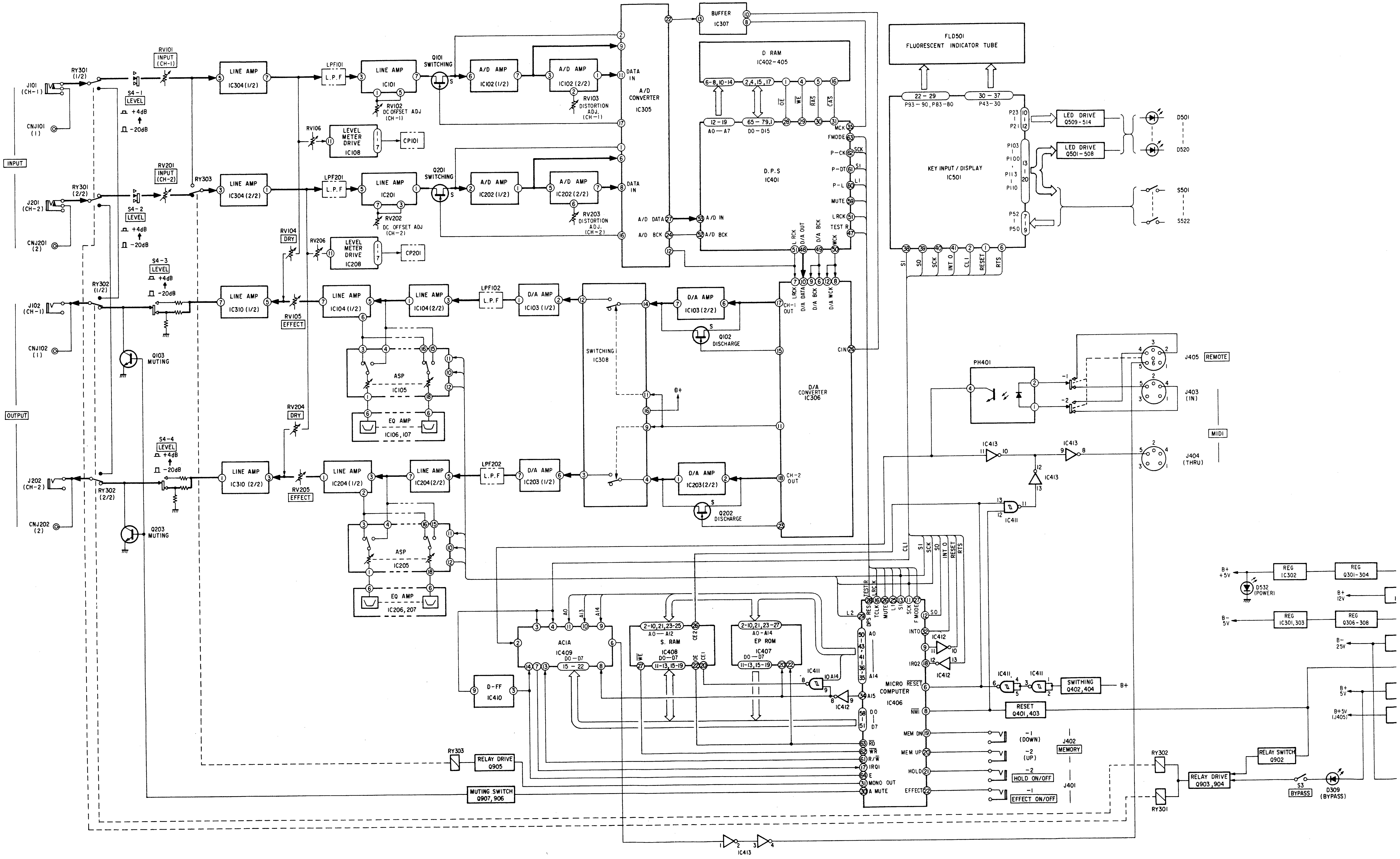
[2CH DIGITAL REVERBERATOR]
Model MU-R201 MIDI Implementation Chart
Date : 11/21,1986
Version : 1.0

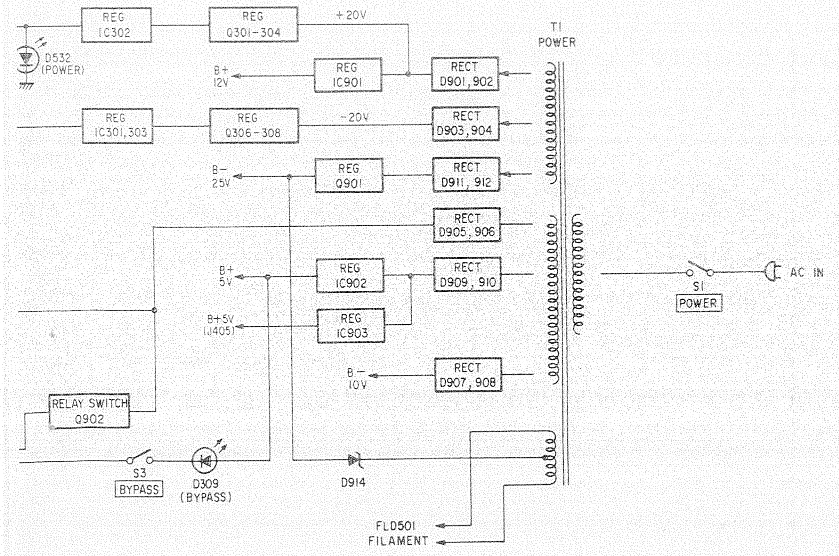
Function ...		Transmitted	Recognized	Remarks
Basic	Default	X	1-16	Memorized
Channel	Changed	X	1-16	
	Default	X	OMNI ON/OFF	Memorized
Mode	Messages	X	X	
	Altered	**********		
Note		X	O	
Number	: True voice	**********	X	
Velocity	Note ON	X	O	
	Note OFF	X	X	
After	Key´s	X	X	
Touch	Ch´s	X	O	
Pitch Bender		X	X	
Control Change	0-121	X	O	
Prog		X	O 0-127	
Change	: True #	**********		
System Exclusive		O	O	
System	: Song Pos	X	X	
	: Song Sel	X	X	
Common	: Tune	X	X	
System	:Clock	X	X	
Real Time	:Commands	X	X	
Aux	:Local ON/OFF	X	X	
	:All Notes OFF	X	X	
Mes-	:Active Sense	X	X	
sages	:Reset	X	O	OMNI ON
Notes				

Mode 1 : OMNI ON, POLY Mode 2 : OMNI ON, MONO
Mode 3 : OMNI OFF, POLY Mode 4 : OMNI OFF, MONO

O : Yes
x : No

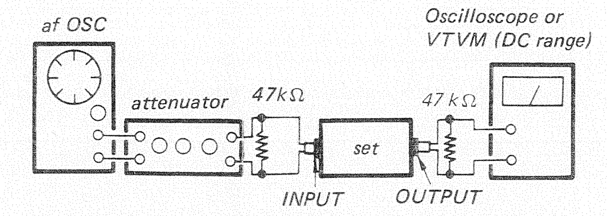
1-16. BLOCK DIAGRAM


INPUT
OUTPUT
J101 (CH-1)
CNJ101 (1)
J201 (CH-2)
CNJ201 (2)
J102 (CH-1)
CNJ102 (1)
J202 (CH-2)
CNJ202 (2)
RY301 (1/2)
RY301 (2/2)
RY302 (1/2)
RY302 (2/2)
RY303
S4-1 LEVEL
S4-2 LEVEL
S4-3 LEVEL
S4-4 LEVEL
+4dB
-20dB
RV101 INPUT (CH-1)
RV201 INPUT (CH-2)
LINE AMP IC304 (1/2)
LINE AMP IC304 (2/2)
LPF101 L.P.F
LPF201 L.P.F
LINE AMP IC101
LINE AMP IC201
RV102 DC OFFSET ADJ (CH-1)
RV202 DC OFFSET ADJ (CH-2)
Q101 SWITCHING
Q201 SWITCHING
A/D AMP IC102 (1/2)
A/D AMP IC102 (2/2)
A/D AMP IC202 (1/2)
A/D AMP IC202 (2/2)
RV103 DISTORTION ADJ. (CH-1)
RV203 DISTORTION ADJ. (CH-2)
RV106
RV206
LEVEL METER DRIVE IC108
LEVEL METER DRIVE IC208
CP101
CP201
DATA IN
A/D CONVERTER IC305
A/D DATA
A/D BCK
BUFFER IC307
D RAM IC402-405
6-8, 10-14
2,4,15,17
12-19 A0-A7
65-79,1 D0-D15
OE
WE
RAS
CAS
D.P.S IC401
MCK
FMODE
P-CK
P-DT
P-L
MUTE
LRCK
TEST R
SCK
SI
LI
A/D IN
A/D BCK
L RCK
D/A OUT
D/A BCK
WCK
FLD501 FLUORESCENT INDICATOR TUBE
22-29 P93-90, P83-80
30-37 P43-30
KEY INPUT / DISPLAY IC501
P23
P21
P103
P100
P113
P110
P52
P50
LED DRIVE Q509-514
LED DRIVE Q501-508
D501
D520
S501
S522
SI
SO
SCK
INT O
CLI
RESET
RTS
RV104 DRY
RV204 DRY
RV105 EFFECT
RV205 EFFECT
LINE AMP IC310 (1/2)
LINE AMP IC310 (2/2)
LINE AMP IC104 (1/2)
LINE AMP IC104 (2/2)
LINE AMP IC204 (1/2)
LINE AMP IC204 (2/2)
LPF102 L.P.F
LPF202 L.P.F
D/A AMP IC103 (1/2)
D/A AMP IC103 (2/2)
D/A AMP IC203 (1/2)
D/A AMP IC203 (2/2)
Q103 MUTING
Q203 MUTING
ASP IC105
ASP IC205
EQ AMP IC106, 107
EQ AMP IC206, 207
SWITCHING IC308
B+
Q102 DISCHARGE
Q202 DISCHARGE
CH-1 OUT
CH-2 OUT
D/A DATA
D/A BCK
D/A WCK
LRCK
CIN
D/A CONVERTER IC306
PH401
J405 REMOTE
J403 (IN)
J404 (THRU)
MIDI
IC413
IC411
IC412
ACIA IC409
D0-D7
15-22
A0
A13
A14
S. RAM IC408
2-10, 21, 23-25
A0-A12
D0-D7
11-13, 15-19
CE2
OE
CE1
WE
EP ROM IC407
2-10, 21, 23-27
A0-A14
D-FF IC410
TEST R
L RCK
DPS RES
TCLK
MUTE
SCK
F MODE
SO
L2
A0
A14
A15
D0
D7
INTO
IRQ2
MICRO COMPUTER IC406
RESET
NMI
RD
WR
R/W
IRQ1
E
MONO OUT
A MUTE
MEM DN
MEM UP
HOLD
EFFECT
-1 (DOWN)
-2 (UP)
J402 MEMORY
-2 HOLD ON/OFF
-1 EFFECT ON/OFF
J401
SWITHING Q402, 404
RESET Q401, 403
RY303
RELAY DRIVE Q905
MUTING SWITCH Q907, 906
B+ +5V
D532 (POWER)
REG IC302
REG Q301-304
B+ 12V
B- 5V
REG IC301, 303
REG Q306-308
B- 25V
B+ 5V
B+5V (J405)
RELAY SWITCH Q902
RELAY DRIVE Q903, 904
RY302
RY301
S3 BYPASS
D309 (BYPASS)


REG
IC302
REG
Q301-304
+20V
T1
POWER
D532
(POWER)
B+
12V
REG
IC901
RECT
D901, 902
REG
IC301, 303
REG
Q306-308
-20V
RECT
D903, 904
B-
25V
REG
Q901
RECT
D911, 912
RECT
D905, 906
B+
5V
REG
IC902
RECT
D909, 910
S1
POWER
AC IN
B+5V
(J405)
REG
IC903
B-
10V
RECT
D907, 908
RELAY SWITCH
Q902
S3
BYPASS
D309
(BYPASS)
D914
FLD501
FILAMENT

Distortion Adjustment

Setting:

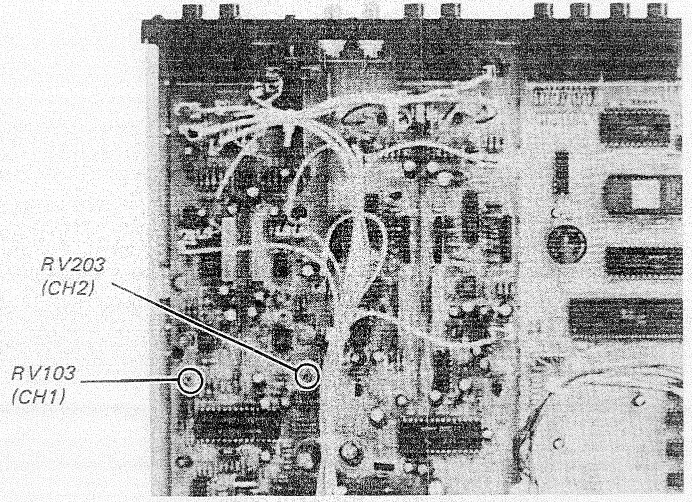

af OSC
Oscilloscope or
VTVM (DC range)
attenuator
47kΩ
47kΩ
set
INPUT
OUTPUT

1. INPUT Volume : MAX
   EFFECT Volume : MAX
   DRY Volume : MIN
   LEVEL Switch : +4dB
2. Select No. 05 of preset memories and the Adjusting Mode②.

Procedure:

1. Enter 1kHz through the INPUT terminal, and set the INPUT level to make the OUTPUT level +17dBs.
2. Fully turn the RV103 (RV203) clockwise.
3. While turning the RV103 (RV203) counterclockwise, adjust the distortion rate to the minimum (less than −80dB).

Adjustment Location: audio board


RV203
(CH2)
RV103
(CH1)

SECTION 2
ELECTRICAL ADJUSTMENTS

OFF-SET Adjustment

It takes a little time until OFF-SET is stabilized depending on the temperature characteristics.

Adjust OFF-SET five minutes after putting power on the set.

Setting:

1. Press the PRESET MEMORY key, and select No. 05 of the preset memories.
2. Press the EDIT key, and set the REPEAT key to 0.
   This state shall be regarded as Adjusting Mode①.

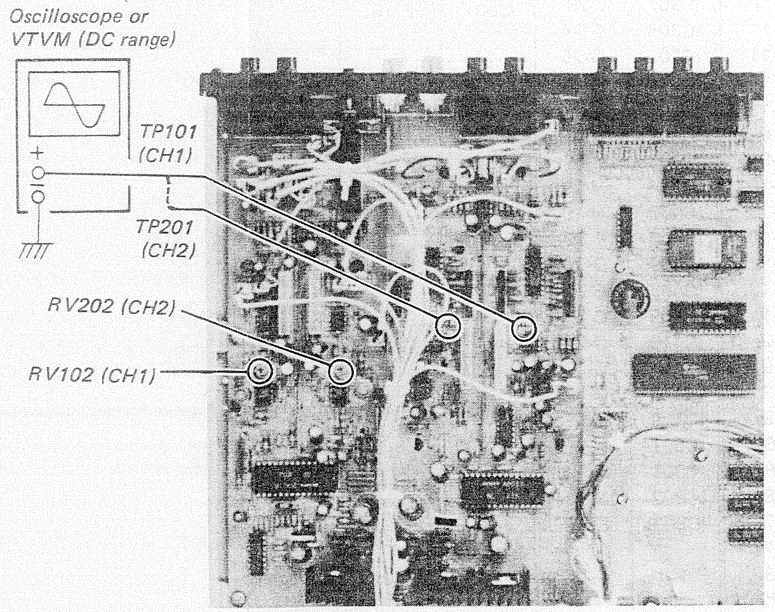
MODE 5
E RFL. T: 1
E RFL. L: 000
REPEAT: 0
EQ: Flat
EFF. LEV: 1.000

3. Set E RFL. L to .992.
   This state shall be regarded as Adjusting Mode②.

MODE 5
E RFL. T: 1
E RFL. L: .992
REPEAT: 0
EQ: Flat
EFF. LEV: 1.000

Procedure:

1. INPUT Volume: MIN
2. Connect the VTVM (DC range) or the oscilloscope to the TP101 (CH1), and the TP201 (CH2)
3. Adjust the RV102 (202) to make the voltage in the Adjusting Mode ① nearly equal to that in the Mode②.
   (The difference shall be within ±5mV.)


Oscilloscope or
VTVM (DC range)
TP101
(CH1)
TP201
(CH2)
RV202 (CH2)
RV102 (CH1)

SECTION 3
DIAGRAMS

3-1. MOUNTING DIAGRAM

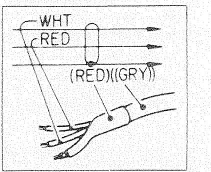
- Semiconductor Locations

Refer to page 63 for Semiconductor Lead Layouts.

Ref. No.	Location	Ref. No.	Location	Ref. No.	Location
CP101	K-13	D901	L-18	Q101	G-29
CP102	K-13	D902	L-18	Q102	H-23
		D903	K-18	Q103	D-24
D101	F-28	D904	K-18	Q201	G-26
D102	G-28	D905	J-18	Q202	H-25
D103	G-23	D906	J-18	Q203	C-25
D201	F-27	D907	J-17	Q301	J-27
D202	G-27	D908	J-18	Q302	J-27
D203	G-25	D909	J-17	Q303	J-26
D301	J-26	D910	J-17	Q304	J-27
D302	J-26	D911	J-17	Q305	J-25
D304	I-27	D912	J-17	Q306	J-25
D306	C-28	D913	I-17	Q307	J-25
D307	B-24	D914	H-16	Q308	J-25
D308	B-27	D915	H-18	Q401	G-19
D309	B-15			Q402	E-19
D401	F-22	IC101	E-28	Q403	G-19
D402	F-22	IC102	G-28	Q404	F-18
D403	B-19	IC103	G-23	Q501	E-9
D404	D-19	IC104	F-23	Q502	E-10
D405	C-22	IC105	D-23	Q503	E-6
D406	B-22	IC106	E-23	Q504	E-7
D407	C-22	IC107	E-24	Q505	E-7
D408	B-22	IC108	K-22	Q506	D-6
D409	C-22	IC201	E-27	Q507	D-7
D410	B-21	IC202	G-27	Q508	D-7
D411	C-21	IC203	G-25	Q509	D-5
D412	B-21	IC204	F-25	Q510	E-8
D413	E-18	IC205	D-25	Q511	D-8
D414	F-21	IC206	E-24	Q512	D-5
D501	E-6	IC207	E-26	Q513	E-8
D502	E-7	IC208	K-20	Q514	D-8
D503	E-8	IC301	J-24	Q901	I-16
D504	D-6	IC302	J-27	Q902	G-17
D505	D-7	IC303	I-25	Q903	F-17
D506	D-8	IC304	D-27	Q904	F-17
D507	E-9	IC305	H-28	Q905	B-23
D508	E-9	IC306	I-24	Q906	G-17
D509	E-10	IC307	J-28	Q907	F-18
D510	E-11	IC308	G-24		
D511	E-11	IC309	D-25		
D512	E-17	IC310	C-24		
D513	E-13	IC401	I-21		
D514	D-9	IC402	I-19		
D515	D-9	IC403	I-19		
D516	D-10	IC404	H-19		
D517	D-10	IC405	H-19		
D518	D-10	IC406	F-20		
D519	D-12	IC407	D-20		
D520	D-13	IC408	E-20		
D521	D-1	IC409	C-20		
D522	D-2	IC410	D-22		
D523	D-9	IC411	D-19		
D524	D-2	IC412	C-19		
D525	D-9	IC413	B-17		
D526	E-6	IC501	E-4		
D527	E-6	IC901	K-19		
D528	D-8	IC902	G-17		
D529	D-7	IC903	F-17		
D530	D-7				
D531	D-8	PH401	C-19		
D532	J-29				

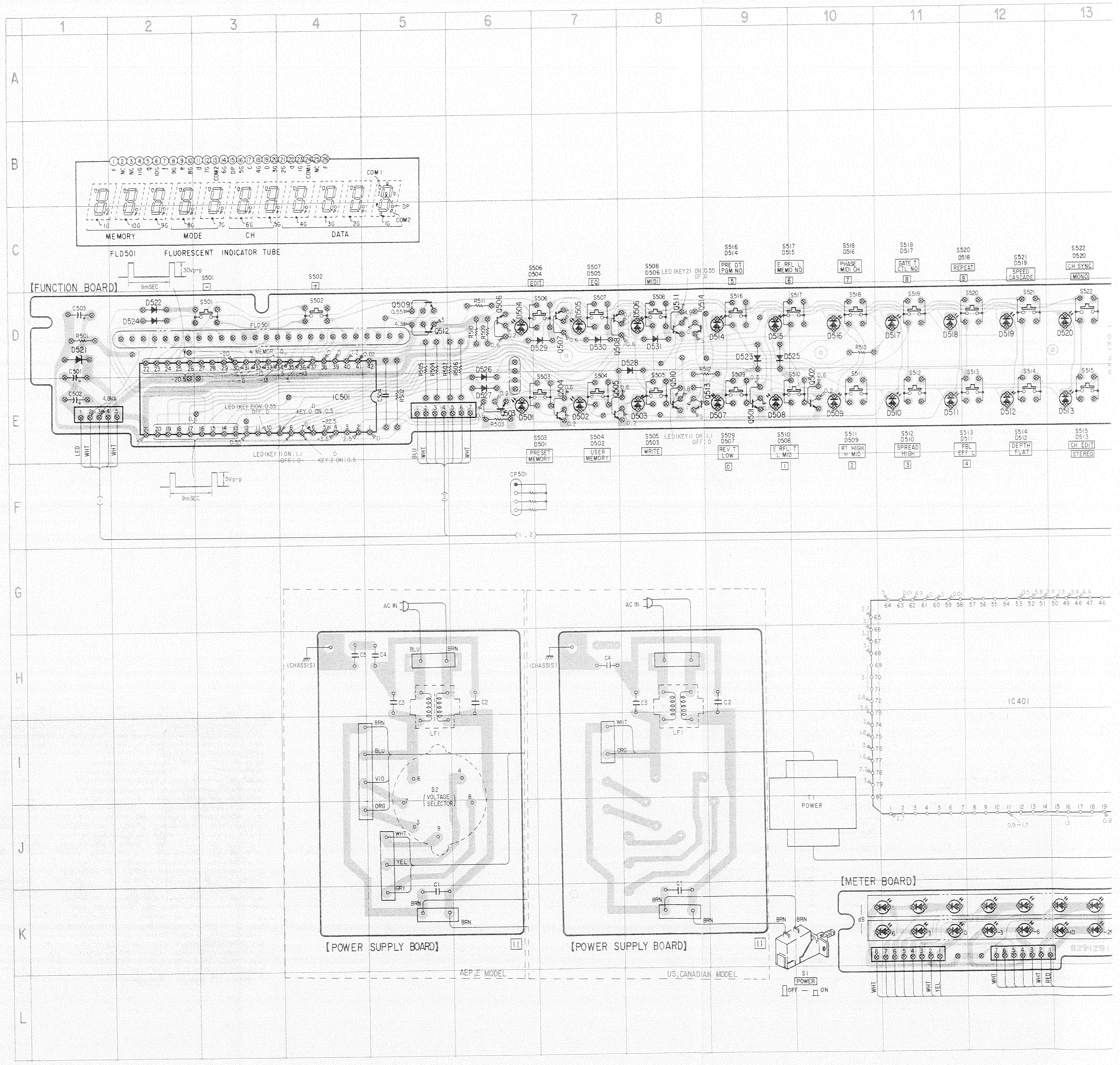
Note:

- Color code of sleeving over the end of the jacket.



WHT
RED
(RED)(GRY)

- ●—— : parts extracted from the conductor side.
- ○—— : parts extracted from the component side.
- ⊗ : Through hole.
- ▨ : component-side pattern.



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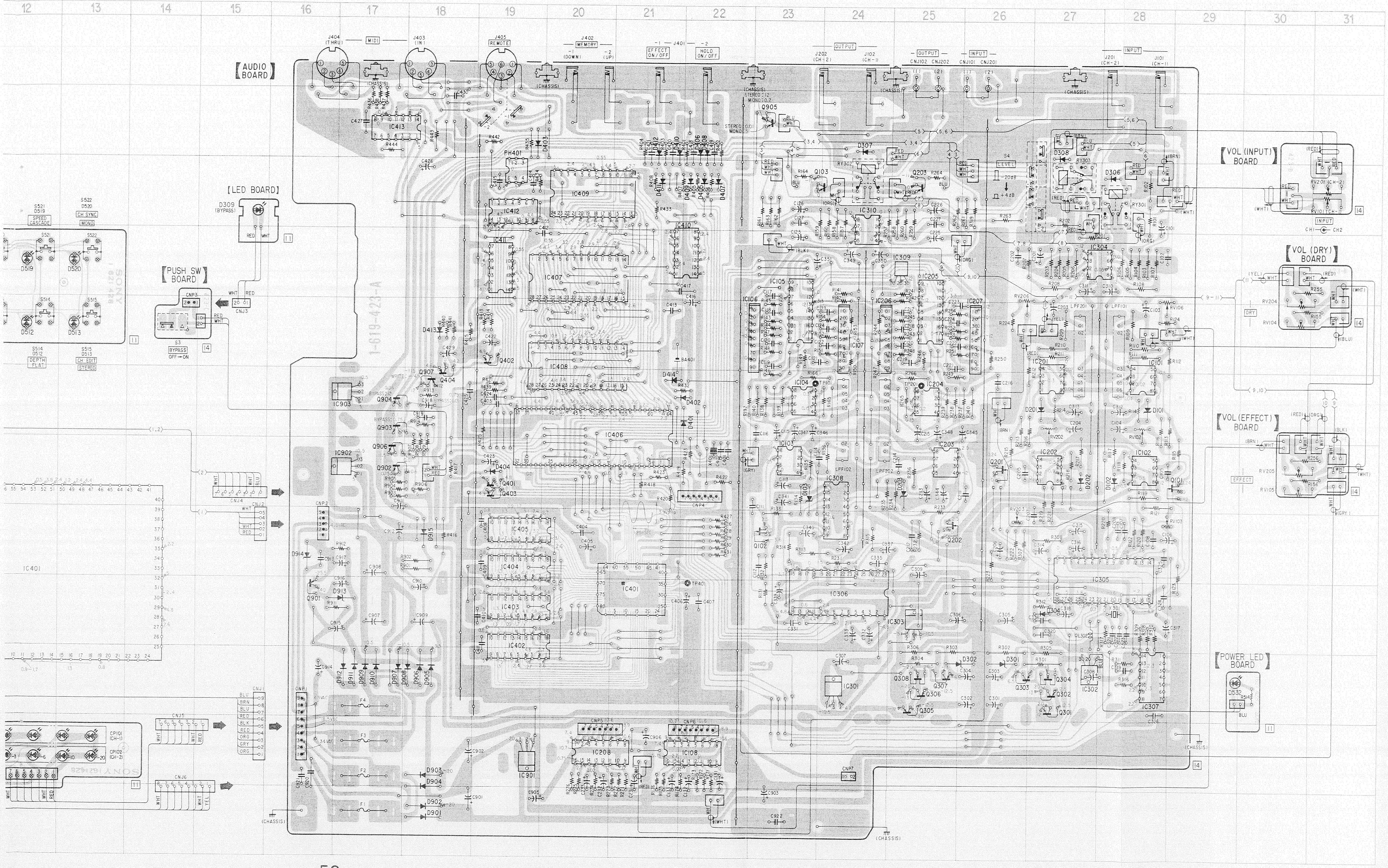
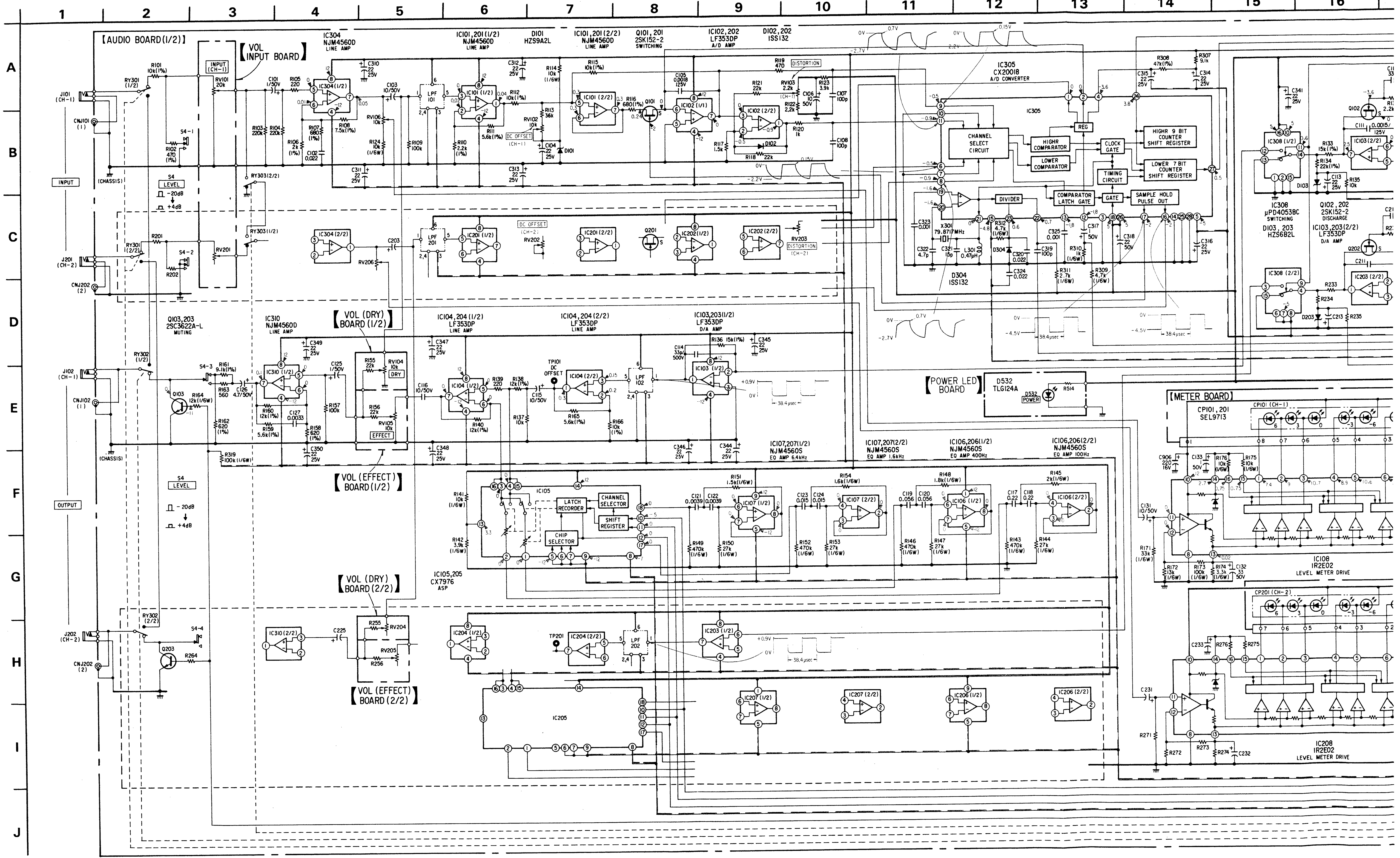
12
13
A
B
C
D
E
F
G
H
I
J
K
L
MEMORY
MODE
CH
DATA
COM1
COM2
DP
FLD501
FLUORESCENT INDICATOR TUBE
[FUNCTION BOARD]
30Vp-p
9mSEC
5Vp-p
9mSEC
IC501
S501
S502
S503
S504
S505
S506
S507
S508
S509
S510
S511
S512
S513
S514
S515
S516
S517
S518
S519
S520
S521
S522
EDIT
EQ
MIDI
PRE DT PGM NO
E RFL L MEMO NO
PHASE MIDI CH
GATE T CTL NO
REPEAT
SPEED CASCADE
CH SYNC
MONO
PRESET MEMORY
USER MEMORY
WRITE
REV T LOW
E RFL T L MID
RT HIGH H MID
SPREAD HIGH
FBL EFF L
DEPTH FLAT
CH EDIT STEREO
CP501
LED
WHT
BLU
AC IN
(CHASSIS)
S2
VOLTAGE SELECTOR
LF1
[POWER SUPPLY BOARD]
AEP, E MODEL
US, CANADIAN MODEL
T1
POWER
S1
POWER
OFF
ON
IC401
[METER BOARD]
dB


【AUDIO BOARD】
【LED BOARD】
【PUSH SW BOARD】
【VOL (INPUT) BOARD】
【VOL (DRY) BOARD】
【VOL (EFFECT) BOARD】
【POWER LED BOARD】
J404 (THRU)
MIDI
J403 (IN)
J405 REMOTE
J402 MEMORY
J401
EFFECT ON/OFF
HOLD ON/OFF
J202 (CH-2)
OUTPUT
J102 (CH-1)
CNJ102 CNJ202
INPUT
CNJ101 CNJ201
J201 (CH-2)
J101 (CH-1)
S4 LEVEL
S3 BYPASS OFF→ON
D309 (BYPASS)
S521 D519 SPEED CASCADE
S522 D520 CH SYNC MONO
S514 D512 DEPTH FLAT
S515 D513 CH EDIT STEREO
IC401
IC402
IC403
IC404
IC405
IC406
IC407
IC408
IC409
IC410
IC411
IC412
IC413
IC901
IC902
IC903
IC101
IC102
IC103
IC104
IC105
IC106
IC107
IC108
IC201
IC202
IC203
IC204
IC205
IC206
IC207
IC208
IC301
IC302
IC303
IC304
IC305
IC306
IC307
IC308
IC309
IC310
1-619-423-A
(CHASSIS)

3-2. SCHEMATIC DIAGRAM – AUDIO SECTION –

• Refer to page 62 for note.


1
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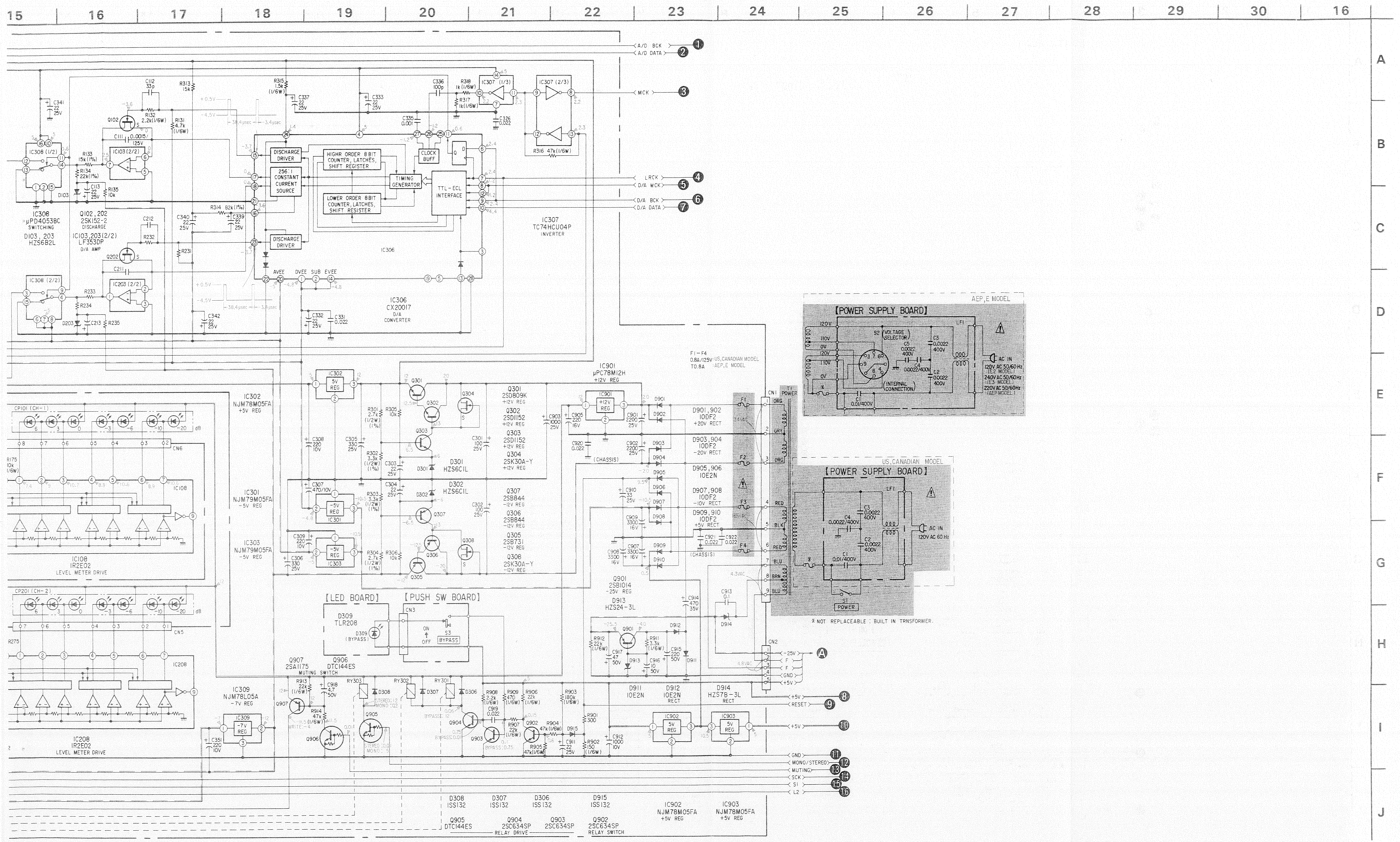
16
A
B
C
D
E
F
G
H
I
J
【AUDIO BOARD(1/2)】
【VOL INPUT BOARD】
INPUT (CH-1)
RV101 20k
IC304 NJM4560D LINE AMP
IC101,201(1/2) NJM4560D LINE AMP
D101 HZS9A2L
IC101,201(2/2) NJM4560D LINE AMP
Q101,201 2SK152-2 SWITCHING
IC102,202 LF353DP A/D AMP
D102,202 1SS132
IC305 CX20018 A/D CONVERTER
DISTORTION
DC OFFSET (CH-1)
DC OFFSET (CH-2)
DISTORTION (CH-2)
LPF 101
LPF 201
LPF 102
LPF 202
J101 (CH-1)
CNJ101 (1)
J201 (CH-2)
CNJ202 (2)
J102 (CH-1)
CNJ102 (1)
J202 (CH-2)
CNJ202 (2)
INPUT
OUTPUT
(CHASSIS)
S4 LEVEL
-20dB
+4dB
S4-1
S4-2
S4-3
S4-4
RY301 (1/2)
RY301 (2/2)
RY302 (1/2)
RY302 (2/2)
RY303 (1/2)
RY303 (2/2)
Q103,203 2SC3622A-L MUTING
IC310 NJM4560D LINE AMP
【VOL (DRY) BOARD (1/2)】
【VOL (EFFECT) BOARD (1/2)】
【VOL (DRY) BOARD (2/2)】
【VOL (EFFECT) BOARD (2/2)】
DRY
EFFECT
IC104,204(1/2) LF353DP LINE AMP
IC104,204(2/2) LF353DP LINE AMP
IC103,203(1/2) LF353DP D/A AMP
TP101 DC OFFSET
TP201
IC105 IC105,205 CX7976 ASP
LATCH RECORDER
CHANNEL SELECTOR
SHIFT REGISTER
CHIP SELECTOR
IC205
IC107,207(1/2) NJM4560S EQ AMP 6.4kHz
IC107,207(2/2) NJM4560S EQ AMP 1.6kHz
IC106,206(1/2) NJM4560S EQ AMP 400Hz
IC106,206(2/2) NJM4560S EQ AMP 100Hz
CHANNEL SELECT CIRCUIT
HIGHR COMPARATOR
LOWER COMPARATOR
REG
CLOCK GATE
HIGHR 9 BIT COUNTER SHIFT REGISTER
LOWER 7 BIT COUNTER SHIFT REGISTER
TIMING CIRCUIT
DIVIDER
COMPARATOR LATCH GATE
GATE
SAMPLE HOLD PULSE OUT
X301 79.8717MHz
L301 0.47μH
D304 1SS132
IC308 μPD4053BC SWITCHING
D103,203 HZS6B2L
Q102,202 2SK152-2 DISCHARGE
IC103,203(2/2) LF353DP D/A AMP
【POWER LED BOARD】
D532 TLG124A
POWER
【METER BOARD】
CP101,201 SEL9713
CP101 (CH-1)
CP201 (CH-2)
IC108 IR2E02 LEVEL METER DRIVE
IC208 IR2E02 LEVEL METER DRIVE
38.4μsec
+0.9V
0V
-2.7V
0.7V
0.15V
2.2V
-4.5V


15
16
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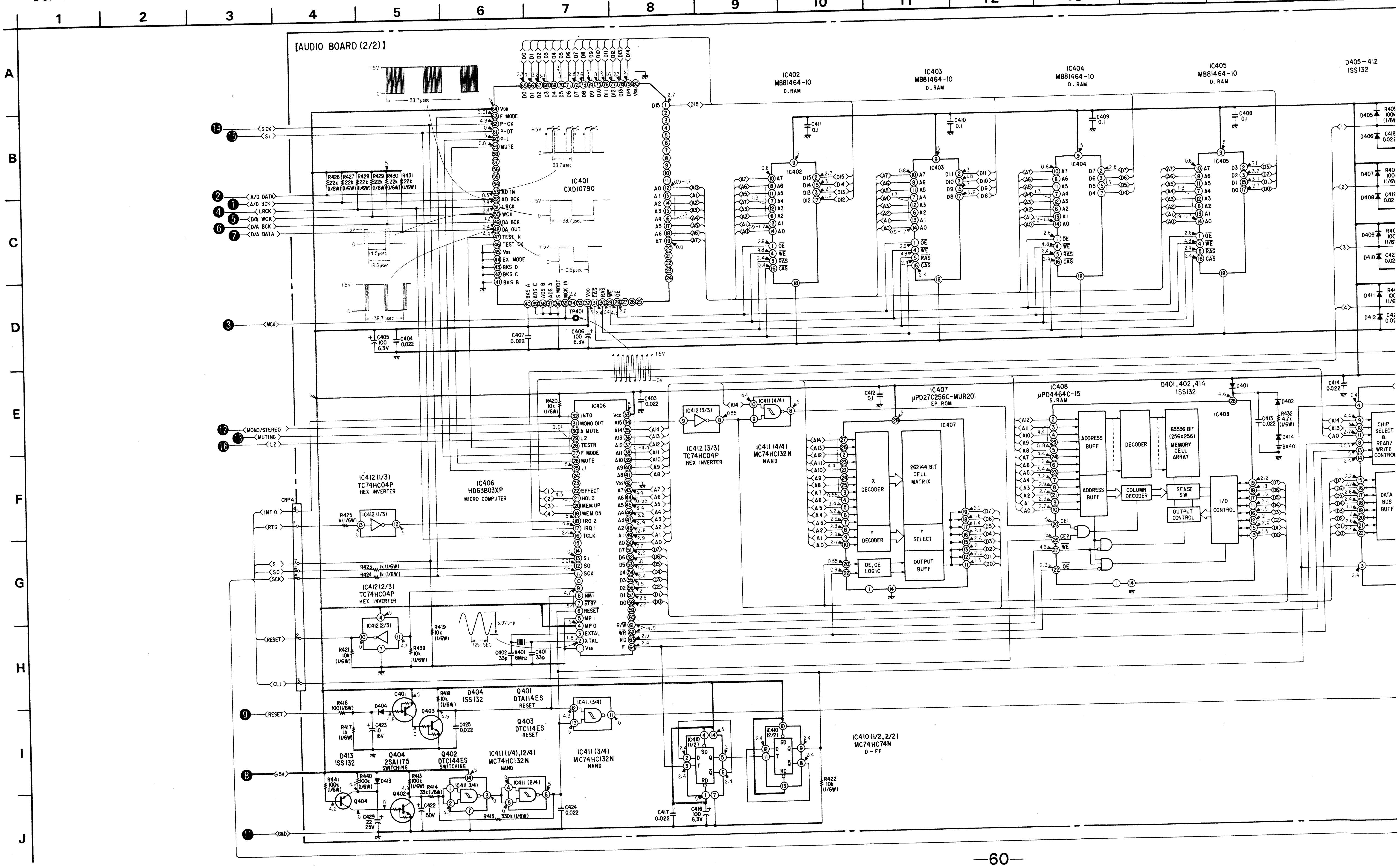
27
28
29
30
16
A
B
C
D
E
F
G
H
I
J
A/D BCK
A/D DATA
MCK
LRCK
D/A WCK
D/A BCK
D/A DATA
❶
❷
❸
❹
❺
❻
❼
IC308 (1/2)
IC308 (2/2)
IC308
μPD4053BC
SWITCHING
D103, 203
HZS6B2L
Q102, 202
2SK152-2
DISCHARGE
IC103, 203 (2/2)
LF353DP
D/A AMP
IC103 (2/2)
IC203 (2/2)
C112 33p
R313 15k
R315 1.5k (1/6W)
C337 22 25V
C333 22 25V
C336 100p
R318 1k (1/6W)
R317 1k (1/6W)
IC307 (1/3)
IC307 (2/3)
C335 0.001
C326 0.022
R316 47k (1/6W)
C341 22 25V
R132 2.2k (1/6W)
R131 4.7k (1/6W)
C111 0.0015 125V
R133 15k (1%)
R134 22k (1%)
C113 22 25V
R135 10k
D103
DISCHARGE DRIVER
256:1 CONSTANT CURRENT SOURCE
HIGHR ORDER 8 BIT COUNTER, LATCHES, SHIFT REGISTER
LOWER ORDER 8 BIT COUNTER, LATCHES, SHIFT RESISTER
CLOCK BUFF
TIMING GENERATOR
TTL-ECL INTERFACE
IC306
IC306
CX20017
D/A CONVERTER
IC307
TC74HCU04P
INVERTER
R314 82k (1%)
C340 22 25V
C339 22 25V
C212
R232
R231
Q202
C211
R233
R234
R235
C213
D203
C342 22 25V
C332 22 25V
C331 0.022
AVEE
DVEE
SUB
EVEE
38.4μsec
3.4μsec
+0.5V
-4.5V
IC302
NJM78M05FA
+5V REG
IC301
NJM79M05FA
-5V REG
IC303
NJM79M05FA
-5V REG
IC302 5V REG
IC301 -5V REG
IC303 -5V REG
Q301
2SD809K
+12V REG
Q302
2SD1152
+12V REG
Q303
2SD1152
+12V REG
Q304
2SK30A-Y
+12V REG
Q307
2SB844
-12V REG
Q306
2SB844
-12V REG
Q305
2SB731
-12V REG
Q308
2SK30A-Y
-12V REG
D301
HZS6C1L
D302
HZS6C1L
R301 2.7k (1/2W) (1%)
R305 10k
R302 3.3k (1/2W) (1%)
R303 3.3k (1/2W) (1%)
R304 2.7k (1/2W) (1%)
R306 10k
C308 220 10V
C305 330 25V
C303 22 25V
C304 22 25V
C301 100 25V
C302 100 25V
C307 470/10V
C309 220 10V
C306 330 25V
IC901
μPC78M12H
+12V REG
IC901 +12V REG
C903 1000 25V
C905 220 16V
C920 0.022
C901 2200 25V
C902 2200 25V
(CHASSIS)
C910 33 25V
C909 3300 16V
C907 3300 16V
C908 3300 16V
C921 0.022
C922 0.022
D901, 902
10DF2
+20V RECT
D903, 904
10DF2
-20V RECT
D905, 906
10E2N
D907, 908
10DF2
-10V RECT
D909, 910
10DF2
+5V RECT
Q901
2SB1014
-25V REG
D913
HZS24-3L
C914 470 35V
C913 0.1
D914
R912 22k (1/6W)
R911 3.3k (1/6W)
C917 47 50V
C915 220 50V
C916 10 50V
D911
D912
F1-F4
0.8A/125V: US, CANADIAN MODEL
T0.8A : AEP, E MODEL
F1
F2
F3
F4
CN1
T1 POWER
ORG
GRY
ORG
RED
BLK
RED
BLU
BRN
BLU
3.4VAC
4.3VAC
4.8VAC
AEP, E MODEL
【POWER SUPPLY BOARD】
120V
110V
0V
120V
110V
0V
S2 (VOLTAGE SELECTOR)
C5 0.0022 400V
C3 0.0022 400V
C4 0.0022/400V
C2 0.0022 400V
C1 0.01/400V
(INTERNAL CONNECTION)
LF1
AC IN
120V AC 50/60Hz (E2 MODEL)
240V AC 50/60Hz (E3 MODEL)
220V AC 50/60Hz (AEP MODEL)
US, CANADIAN MODEL
【POWER SUPPLY BOARD】
C4 0.0022/400V
C3 0.0022 400V
C2 0.0022 400V
C1 0.01/400V
LF1
AC IN
120V AC 60Hz
S1 POWER
※NOT REPLACEABLE : BUILT IN TRNSFORMER.
CN2
-25V
F
F
GND
+5V
Ⓐ
+5V
RESET
+5V
GND
MONO/STEREO
MUTING
SCK
S1
L2
❽
❾
❿
⓫
⓬
⓭
⓮
⓯
⓰
CP101 (CH-1)
CP201 (CH-2)
dB
-20
-10
-6
-3
0
3
6
CN6
CN5
R175 10k (1/6W)
R275
IC108
IC208
IC108
IR2E02
LEVEL METER DRIVE
IC208
IR2E02
LEVEL METER DRIVE
【LED BOARD】
【PUSH SW BOARD】
D309
TLR208
D309 (BYPASS)
CN3
ON
OFF
S3 BYPASS
Q907
2SA1175
MUTING SWITCH
Q906
DTC144ES
IC309
NJM78L05A
-7V REG
IC309 -7V REG
C351 220 10V
R913 22k (1/6W)
C918 4.7 50V
R914 47k (1/6W)
RY303
RY302
RY301
D308
D307
D306
Q905
Q904
Q903
Q902
STEREO
MONO
BYPASS
R908 2.2k (1/6W)
R909 470 (1/6W)
R906 22k (1/6W)
R903 180k (1/6W)
C919 0.022
R907 22k (1/6W)
R904 47k (1/6W)
R905 47k (1/6W)
D915
C911 22 25V
R902 150 (1/6W)
R901 300
C912 1000 10V
D911
10E2N
D912
10E2N
RECT
D914
HZS7B-3L
RECT
IC902 5V REG
IC903 5V REG
D308
1SS132
D307
1SS132
D306
1SS132
D915
1SS132
IC902
NJM78M05FA
+5V REG
IC903
NJM78M05FA
+5V REG
Q905
DTC144ES
Q904
2SC634SP
Q903
2SC634SP
RELAY DRIVE
Q902
2SC634SP
RELAY SWITCH

3-3. SCHEMATIC DIAGRAM –SYSTEM CONTROL SECTION–


1
2
3
4
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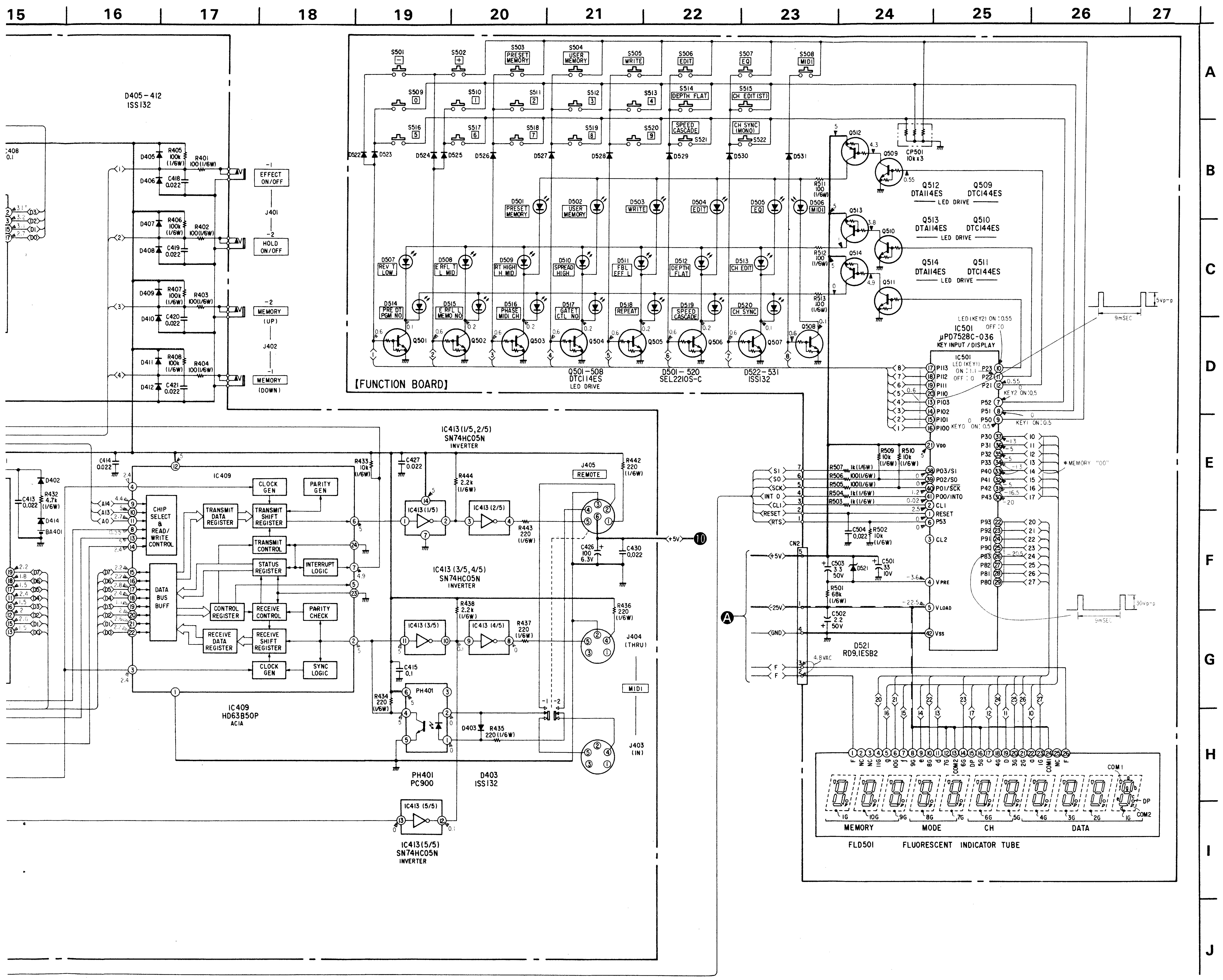
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
[AUDIO BOARD (2/2)]
38.7μsec
14.5μsec
19.3μsec
0.6μsec
IC401
CXD1079Q
VDD
F MODE
P-CK
P-DT
P-L
MUTE
AD IN
AD BCK
LRCK
WCK
DA BCK
DA OUT
TEST R
TEST CK
Vss
EX MODE
BKS D
BKS C
BKS B
TP401
IC402
MB81464-10
D.RAM
IC403
MB81464-10
D.RAM
IC404
MB81464-10
D.RAM
IC405
MB81464-10
D.RAM
D405-412
ISS132
SCK
SI
A/D DATA
A/D BCK
LRCK
D/A WCK
D/A BCK
D/A DATA
MCK
MONO/STEREO
MUTING
L2
IC406
HD63B03XP
MICRO COMPUTER
IC407
μPD27C256C-MUR201
EP.ROM
X DECODER
Y DECODER
262144 BIT CELL MATRIX
Y SELECT
OUTPUT BUFF
OE, CE LOGIC
IC408
μPD4464C-15
S.RAM
ADDRESS BUFF
DECODER
65536 BIT (256x256) MEMORY CELL ARRAY
COLUMN DECODER
SENSE SW
OUTPUT CONTROL
I/O CONTROL
D401,402,414
ISS132
CHIP SELECT & READ/WRITE CONTROL
DATA BUS BUFF
IC412 (1/3)
TC74HC04P
HEX INVERTER
IC412 (2/3)
TC74HC04P
HEX INVERTER
IC412 (3/3)
TC74HC04P
HEX INVERTER
IC411 (4/4)
MC74HC132N
NAND
CNP4
INT O
RTS
SI
SO
SCK
RESET
CL1
X401
8MHz
3.9Vp-p
125nSEC
RESET
+5V
GND
Q401
DTA114ES
RESET
D404
ISS132
Q403
DTC114ES
RESET
IC411 (1/4),(2/4)
MC74HC132N
NAND
IC411 (3/4)
MC74HC132N
NAND
D413
ISS132
Q404
2SA1175
SWITCHING
Q402
DTC144ES
SWITCHING
IC410 (1/2, 2/2)
MC74HC74N
D-FF


15
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21
22
23
24
25
26
27
A
B
C
D
E
F
G
H
I
J
D405 – 412
1SS132
EFFECT ON/OFF
J401
HOLD ON/OFF
MEMORY (UP)
J402
MEMORY (DOWN)
[FUNCTION BOARD]
S501 –
S502 +
S503 PRESET MEMORY
S504 USER MEMORY
S505 WRITE
S506 EDIT
S507 EQ
S508 MIDI
S514 DEPTH FLAT
S515 CH EDIT (ST)
SPEED CASCADE
CH SYNC (MONO)
Q501 – 508
DTC114ES
LED DRIVE
D501 – 520
SEL2210S-C
D522 – 531
1SS132
Q512 DTA114ES
Q509 DTC144ES
Q513 DTA114ES
Q510 DTC144ES
Q514 DTA114ES
Q511 DTC144ES
LED DRIVE
CP501
10k x 3
IC501
μPD7528C-036
KEY INPUT / DISPLAY
*MEMORY "00"
IC413 (1/5, 2/5)
SN74HC05N
INVERTER
J405
REMOTE
IC409
CLOCK GEN
PARITY GEN
CHIP SELECT & READ/WRITE CONTROL
TRANSMIT DATA REGISTER
TRANSMIT SHIFT REGISTER
TRANSMIT CONTROL
STATUS REGISTER
INTERRUPT LOGIC
DATA BUS BUFF
CONTROL REGISTER
RECEIVE CONTROL
PARITY CHECK
RECEIVE DATA REGISTER
RECEIVE SHIFT REGISTER
CLOCK GEN
SYNC LOGIC
IC409
HD63B50P
ACIA
IC413 (3/5, 4/5)
SN74HC05N
INVERTER
J404 (THRU)
MIDI
J403 (IN)
PH401
PC900
D403
1SS132
IC413 (5/5)
SN74HC05N
INVERTER
D521
RD9.1ESB2
+5V
MEMORY
MODE
CH
DATA
FLD501 FLUORESCENT INDICATOR TUBE

Note:

- All capacitors are in μF unless otherwise noted. pF: μμF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼ W or less unless otherwise specified.

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note: Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

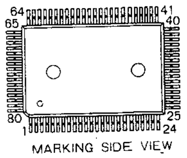
- Components for right channel have same values as for left channel. Reference numbers are coded from 200.
- (1%) : indicates tolerances.
- Switch

Ref. No.	Switch	Position
S1	POWER	ON
S2	BYPASS	OFF
S4	LEVEL –20dB/+4dB	–20dB
S501	–	OFF
S502	+	OFF
S503	PRESET MEMORY	OFF
S504	USER MEMORY	OFF
S505	WRITE	OFF
S506	EDIT	OFF
S507	EQ	OFF
S508	MIDI	OFF
S509	REV T/LOW (0)	OFF
S510	E RFL T/L MID (1)	OFF
S511	RT HIGH/H MID (2)	OFF
S512	SPREAD/HIGH (3)	OFF
S513	FBL/EFF L (4)	OFF
S514	DEPTH/FLAT	OFF
S515	CH EDIT (STEREO)	OFF
S516	PRE DT/PGM NO (5)	OFF
S517	E RFL L/MEMO NO (6)	OFF
S518	PHASE/MIDI CH (7)	OFF
S519	GATE T/CTL NO (8)	OFF
S520	PEPEAT (9)	OFF
S521	SPEED/CASCADE	OFF
S522	CH SYNC (MONO)	OFF

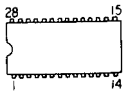
- ▬▬ : B+ bus.
- ▬ ▬ : B– bus.
- ☐ : adjustment for repair.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken under no-signal conditions with a VOM (50 kΩ/V).
- Voltage variations may be noted due to normal production tolerances.

Semiconductor Lead Layouts

CXD1079Q

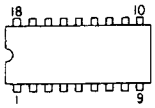

64
41
65
40
80
25
1
24
MARKING SIDE VIEW

CX20017
CX20018
μPD27C256C-MUR201
μPD4464C-15



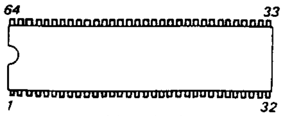
(Top view)

CX7976
MB81464-10



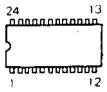
(Top view)

HD63B03XP



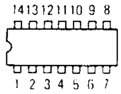
(Top view)

HD63B50P



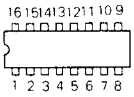
(Top view)

MC74HC74N
MC74HC132N
SN74HC05N
TC74HC04P
TC74HCU04P


14 13 12 11 10 9 8
1 2 3 4 5 6 7

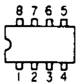
(Top view)

1R2E02
μPD4053BC


16 15 14 13 12 11 10 9
1 2 3 4 5 6 7 8

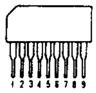
(Top view)

LF353DP
NJM4560D

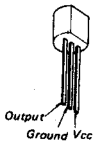


(Top view)

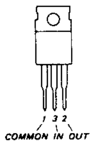
NJM4560S



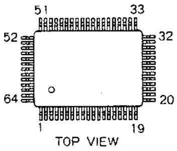
NJM78L05A


Output
Ground
Vcc

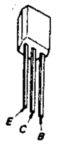
NJM78M05FA
NJM79M05A
μPC78M12H


1 3 2
COMMON IN OUT

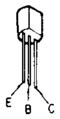
μPD7528C-036


51
33
52
32
64
20
1
19
TOP VIEW

2SC634SP
DTA114ES
DTC114ES
DTC144ES

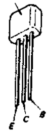


2SB844
2SB1014
2SC3622A-L
2SD1152

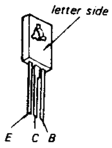


2SA1175

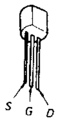
Marking side view



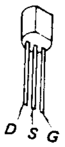
2SB731
2SD809K


letter side
E
C
B

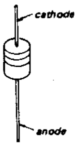
2SK30A-Y



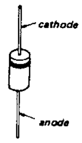
2SK152-2



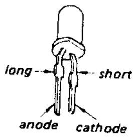
10DF2
10E2N
HZS6B2L
HZS6C1L
HZS7B3L
HZS9A2L
HZS243L
RD9.1ES-B2


cathode
anode

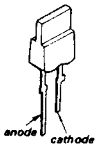
1SS132


cathode
anode

SEL2210S-C
TLG124A


long
short
anode
cathode

TLR208


anode
cathode

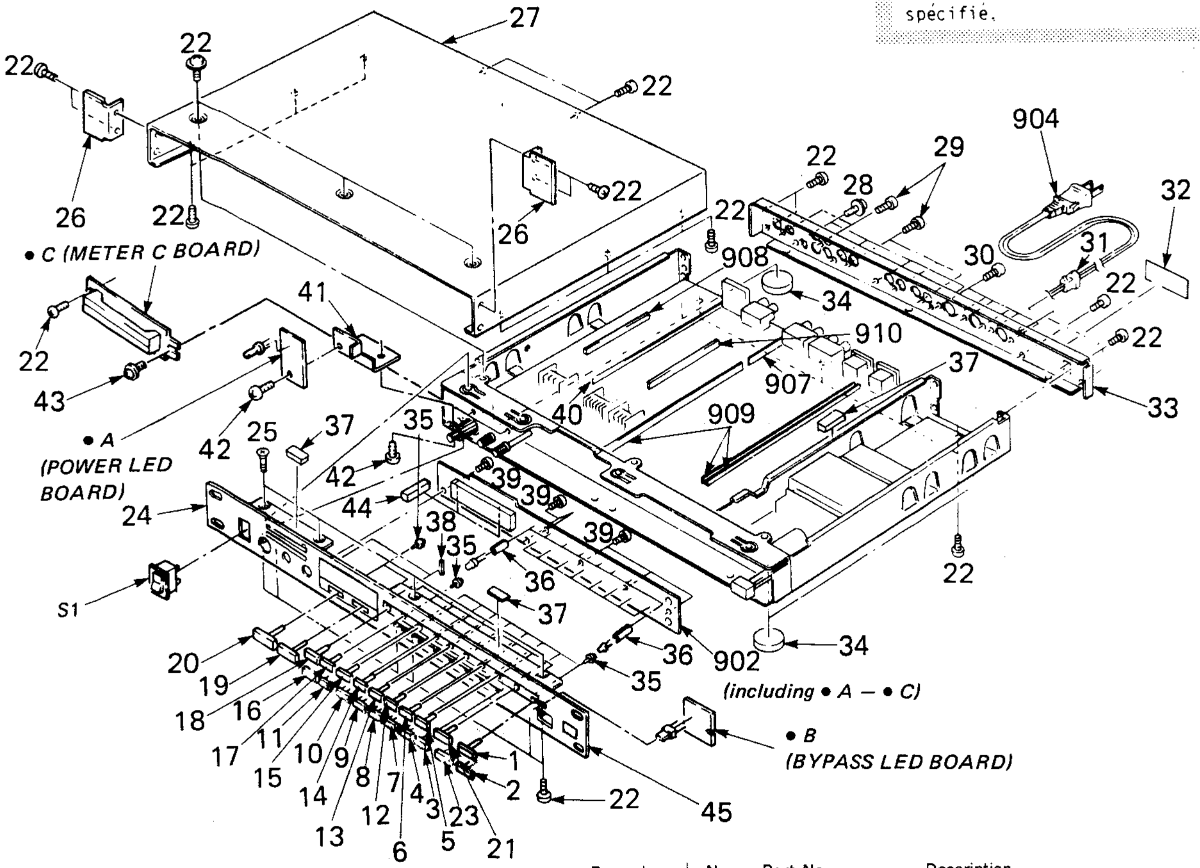
SECTION 4
EXPLODED VIEWS AND PARTS LIST

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Color Indication of Appearance Parts
  Example: (RED) ..... KNOB, BALANCE (WHITE)
  ↑ Cabinet's Color ↑ Parts' Color

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

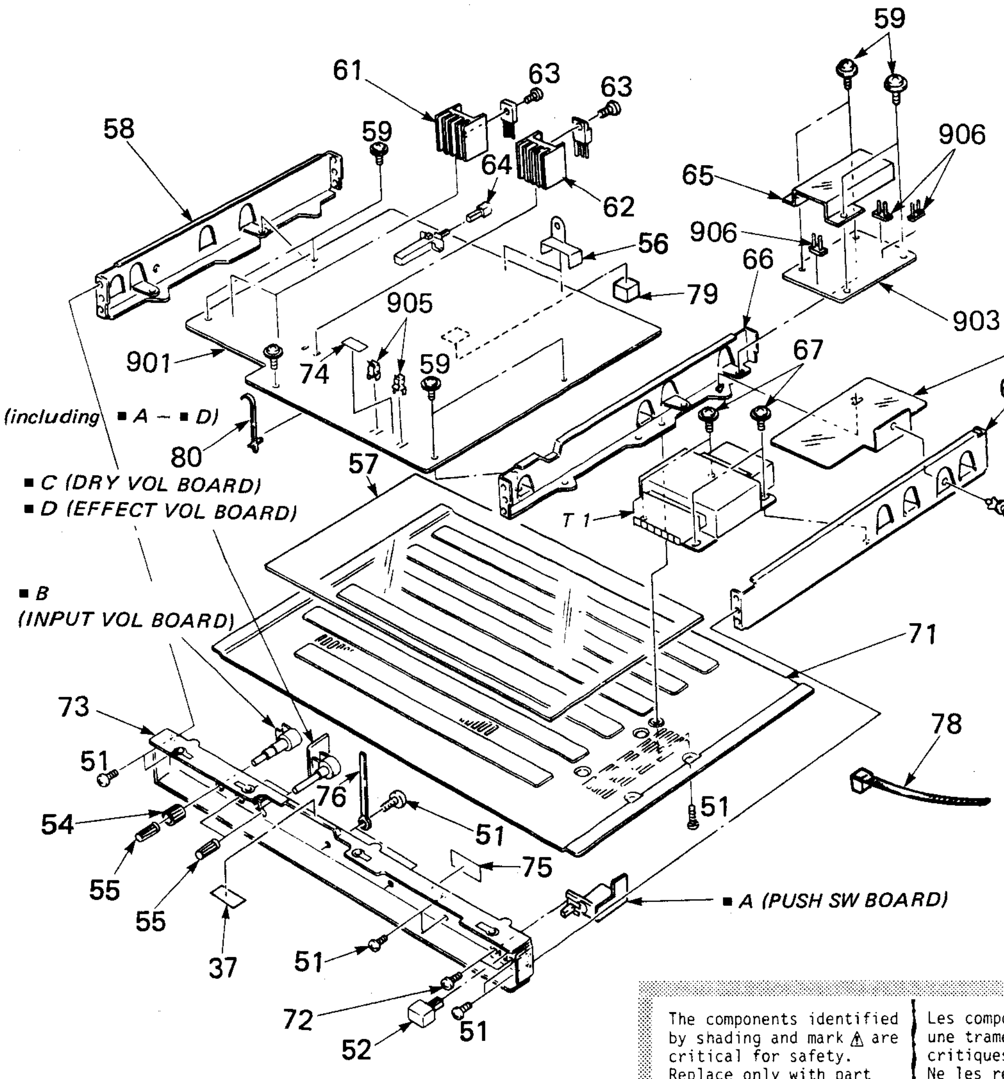
Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

4-1.



No.	Part No.	Description	Remark
1	X-4916-337-1	BUTTON (A) ASSY CONTROL (CH, EDIT)	
2	X-4916-333-1	BUTTON (A) ASSY CONTROL (CH, SYNC)	
3	X-4916-330-1	BUTTON (A) ASSY CONTROL (REPEAT)	
4	X-4916-341-1	BUTTON (A) ASSY CONTROL (GATE T/CTL NO)	
5	X-4916-334-1	BUTTON (A) ASSY CONTROL (FBL/EFF L)	
6	X-4916-335-1	BUTTON (A) ASSY CONTROL (SPREAD/HIGH)	
7	X-4916-332-1	BUTTON (A) ASSY CONTROL (PHASE/MIDI CH)	
8	X-4916-331-1	BUTTON (A) ASSY CONTROL (E RFL L/MEMO NO)	
9	X-4916-336-1	BUTTON (A) ASSY CONTROL (PRE DT/PGM NO)	
10	X-4916-326-1	BUTTON (A) ASSY CONTROL (MIDI)	
11	X-4916-325-1	BUTTON (A) ASSY CONTROL (EQ)	
12	X-4916-340-1	BUTTON (A) ASSY CONTROL (RT HIGH/H MID)	
13	X-4916-339-1	BUTTON (A) ASSY CONTROL (E RFL T/L MID)	
14	X-4916-327-1	BUTTON (A) ASSY CONTROL (REV T/LOW)	
15	X-4916-323-1	BUTTON (A) ASSY CONTROL (WRITE)	
16	X-4916-324-1	BUTTON (A) ASSY CONTROL (EDIT)	
17	X-4916-322-1	BUTTON (A) ASSY CONTROL (USER MEMORY)	
18	X-4916-329-1	BUTTON (A) ASSY CONTROL (PRESET MEMORY)	
19	4-916-332-01	BUTTON (B) ASSY CONTROL (+)	
20	4-916-332-11	BUTTON (B) ASSY CONTROL (−)	
21	X-4916-338-1	BUTTON (A) ASSY CONTROL (DEPTH/FLAT)	
22	3-703-108-21	SCREW +BV3 x 6	
23	X-4916-328-1	BUTTON (A) ASSY CONTROL (SPEED/CASCADE)	
24	X-4916-342-2	PANEL ASSY FRONT	
25	7-682-246-09	SCREW +K3 x 5	
26	★4-916-305-01	REINFORCEMENT	
27	4-916-342-01	CASE	
28	3-701-467-00	SCREW LOCK	
29	7-685-146-19	SCREW +BTP3 x 8 TYPE 2 N-S	
30	7-682-548-09	SCREW +B3 x 8	
31	3-703-571-11	(US,CANADIAN)···BUSHING S(4516),CORD	
	3-703-244-11	(AEP,E)···BUSHING(2104),CORD	
32	4-916-347-01	(US,CANADIAN)···LABEL,MODEL NUMBER	
	4-916-348-01	(E2)···LABEL,MODEL NUMBER	
	4-916-349-01	(E3)··· LABEL, MODEL NUMBER	
	4-916-346-01	(AEP). . . LABEL, MODEL NUMBER	
33	★4-916-316-02	PLATE JACK	
34	★4-907-980-01	FOOT	
35	4-916-333-01	STOPER KNOB	
36	4-911-676-01	SPACER LED	
37	★3-846-067-11	SPACER	
38	★3-671-888-00	CUSHION (B) BUTTON	
39	7-685-134-19	SCREW +BTP2.6 x 8 TYPE 2 N-S	
40	★3-311-617-01	REINFORCEMENT PCB	
41	★4-916-344-01	ANGLE IRON	
42	7-621-775-20	SCREW +B2.6×5	
43	3-703-249-01	SCREW, S TIGHT +PTTWH3 x 6	
44	9-911-838-XX	CUSHION	
45	3-703-710-01	STICKER SONY SYMBOL (12)	
902	★A-4410-366-A	MOUNTED PCB CONTROL	
904	⚠1-558-091-11	(US,CANADIAN)···CORD POWER	
	⚠1-534-817-XX	(AEP, E). . . CORD POWER	
907	★1-560-242-11	BUS BAR 3P	
908	★1-560-242-31	BUS BAR 5P	
909	★1-560-242-41	BUS BAR 11P	
910	★1-560-242-71	BUS BAR 6P	
S1	⚠1-553-575-21	SWITCH (POWER)	

4-2.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63
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906
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906
66
79
905
903
901
74
59
67
68
69
(including ▪ A – ▪ D)
80
70
57
▪ C (DRY VOL BOARD)
▪ D (EFFECT VOL BOARD)
T 1
▪ B
(INPUT VOL BOARD)
71
78
73
51
76
51
54
51
75
55
55
▪ A (PUSH SW BOARD)
37
51
72
51
52

The components identified by shading and mark ⚠ are critical for safety.
Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

No.	Part No.	Description	Remakr
51	3-703-108-21	SCREW +BV3 x 6	
52	4-879-487-51	PUSH BUTTON	
54	4-904-320-21	KNOB, SELECTOR	
55	4-906-511-71	KNOB (SMALL), ROTARY	
56	⋆4-916-318-01	PLATE GROUND	
57	⋆4-916-327-01	SHEET INSULATING	
58	⋆4-916-311-01	CHASSIS (LEFT), SIDE	
61	⋆4-363-146-11	HEAT SINK V, OUT	
62	⋆4-363-146-00	HEAT SINK V, OUT	
63	2-259-121-00	SCREW TR	
64	3-311-509-00	PUSH BUTTON	
65	⋆4-916-304-01	CASE, INSULATING	
66	⋆4-916-313-01	CHASSIS CENTER	
67	7-682-947-01	SCREW+PSW3×6	
68	⋆4-916-303-01	SHEET INSULATING	
69	⋆4-916-312-01	CHASSIS (RIGHT), SIDE	

No.	Part No.	Description	Remark
70	⋆3-531-576-51	RIVET, NYLON	
71	⋆4-916-320-01	PLATE, BOTTOM	
72	7-621-775-20	SCREW +B2.6 x 5	
73	⋆4-916-341-01	CHASSIS FRONT	
74	⋆3-701-948-13	(AEP, E)···LABEL, FUSE	
75	⋆3-703-044-26	(US,Canadian)···LABEL, FUSE CAUTION	
76	⋆3-701-822-00	CORD CLAMP	
78	3-701-748-00	CORD CLAMP	
79	9-911-841-XX	CUSHION	
80	⋆3-683-631-01	CORD CLAMP	
901	⋆A-4335-652-A	MOUNTED PCB, AUDIO	
903	⋆A-4394-418-A	(US,Canadian)···MOUNTED PCB, POWER	
	⋆A-4394-441-A	(AEP,E)···MOUNTED PCB, POWER	
905	1-533-162-00	HOLDER FUSE	
906	⋆1-535-139-00	BASE POST 19MM (10MM PITCH) 2P	
	⚠1-448-592-11	(E) ·················· TRANSFORMER, POWER	
	⚠1-448-593-11	(US, Canadian)··· TRANSFORMER, POWER	

SECTION 5
ELECTRICAL PARTS LIST

NOTE:

- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuitsin a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC, UPD...: μPD...

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Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
901	*A-4335-652-A	MOUNTED PCB, AUDIO			
902	*A-4410-366-A	MOUNTED PCB, CONTROL			
903	*1-619-424-12	PC BOARD, POWER			
904	⚠.1-534-817-XX	(AEP,E)...CORD, POWER			
	⚠.1-558-091-11	(US,CA)...CORD, POWER			
905	1-533-162-00	HOLDER, FUSE			
906	*1-535-139-00	BASE POST 19MM (10MM PITCH) 2P			
907	*1-560-242-11	BUS BAR 3P			
908	*1-560-242-31	BUS BAR 5P			
909	*1-560-242-41	BUS BAR 11P			
910	*1-560-242-71	BUS BAR 6P			
911	*1-564-498-11	PIN, CONNECTOR 5P			
912	*1-564-500-11	PIN, CONNECTOR 7P			
BA401	1-528-120-00	BATTERY, LITHIUM (CR-2025)			
C1	⚠.1-161-744-00	CERAMIC	0.01MF		400V
C2	⚠.1-161-742-00	CERAMIC	0.0022MF	20%	400V
C3	⚠.1-161-742-00	CERAMIC	0.0022MF	20%	400V
C4	⚠.1-161-742-00	CERAMIC	0.0022MF	20%	400V
C5	⚠.1-161-742-00	(AEP,E)...CERAMIC	0.0022MF	20%	400V
C101	1-123-380-00	ELECT	1MF	20%	50V
C102	1-136-157-00	FILM	0.022MF	5%	50V
C103	1-123-356-00	ELECT	10MF	20%	50V
C104	1-123-330-00	ELECT	22MF	20%	25V
C105	1-104-255-11	POLYSTYRENE	0.0018MF	5%	125V
C106	1-123-356-00	ELECT	10MF	20%	50V
C107	1-162-282-31	CERAMIC	100PF	10%	50V
C108	1-162-282-31	CERAMIC	100PF	10%	50V
C111	1-104-228-00	POLYSTYRENE	0.0015MF	5%	125V
C112	1-162-211-31	CERAMIC	33PF	5%	50V
C113	1-123-330-00	ELECT	22MF	20%	25V
C114	1-107-159-00	MICA	33PF	5%	500V
C115	1-123-356-00	ELECT	10MF	20%	50V
C116	1-124-186-00	ELECT	10MF	20%	50V
C117	1-136-169-00	FILM	0.22MF	5%	50V
C118	1-136-169-00	FILM	0.22MF	5%	50V
C119	1-136-162-00	FILM	0.056MF	5%	50V
C120	1-136-162-00	FILM	0.056MF	5%	50V
C121	1-110-202-00	MYLAR	0.0039MF	5%	50V
C122	1-110-202-00	MYLAR	0.0039MF	5%	50V
C123	1-136-155-00	FILM	0.015MF	5%	50V
C124	1-136-155-00	FILM	0.015MF	5%	50V
C125	1-123-380-00	ELECT	1MF	20%	50V
C126	1-123-369-00	ELECT	4.7MF	20%	50V
C127	1-110-201-00	MYLAR	0.0033MF	5%	50V
C131	1-124-907-00	ELECT	10MF	20%	50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C132	1-124-896-91	ELECT	33MF	20%	50V
C133	1-124-903-00	ELECT	1MF	20%	50V
C201	1-123-380-00	ELECT	1MF	20%	50V
C202	1-136-157-00	FILM	0.022MF	5%	50V
C203	1-123-356-00	ELECT	10MF	20%	50V
C204	1-123-330-00	ELECT	22MF	20%	25V
C205	1-104-255-11	POLYSTYRENE	0.0018MF	5%	125V
C206	1-123-356-00	ELECT	10MF	20%	50V
C207	1-162-282-31	CERAMIC	100PF	10%	50V
C208	1-162-282-31	CERAMIC	100PF	10%	50V
C211	1-104-228-00	POLYSTYRENE	0.0015MF	5%	125V
C212	1-162-211-31	CERAMIC	33PF	5%	50V
C213	1-123-330-00	ELECT	22MF	20%	25V
C214	1-107-159-00	MICA	33PF	5%	500V
C215	1-123-356-00	ELECT	10MF	20%	50V
C216	1-124-186-00	ELECT	10MF	20%	50V
C217	1-136-169-00	FILM	0.22MF	5%	50V
C218	1-136-169-00	FILM	0.22MF	5%	50V
C219	1-136-162-00	FILM	0.056MF	5%	50V
C220	1-136-162-00	FILM	0.056MF	5%	50V
C221	1-110-202-00	MYLAR	0.0039MF	5%	50V
C222	1-110-202-00	MYLAR	0.0039MF	5%	50V
C223	1-136-155-00	FILM	0.015MF	5%	50V
C224	1-136-155-00	FILM	0.015MF	5%	50V
C225	1-123-380-00	ELECT	1MF	20%	50V
C226	1-123-369-00	ELECT	4.7MF	20%	50V
C227	1-110-201-00	MYLAR	0.0033MF	5%	50V
C231	1-124-907-00	ELECT	10MF	20%	50V
C232	1-124-904-00	ELECT	2.2MF	20%	50V
C233	1-124-903-00	ELECT	1MF	20%	50V
C301	1-123-333-00	ELECT	100MF	20%	25V
C302	1-123-333-00	ELECT	100MF	20%	25V
C303	1-123-330-00	ELECT	22MF	20%	25V
C304	1-123-330-00	ELECT	22MF	20%	25V
C305	1-124-700-11	ELECT	330MF	20%	25V
C306	1-124-700-11	ELECT	330MF	20%	25V
C307	1-123-310-00	ELECT	470MF	20%	10V
C308	1-123-308-00	ELECT	220MF	20%	10V
C309	1-123-308-00	ELECT	220MF	20%	10V
C310	1-123-330-00	ELECT	22MF	20%	25V
C311	1-123-330-00	ELECT	22MF	20%	25V
C312	1-123-330-00	ELECT	22MF	20%	25V
C313	1-123-330-00	ELECT	22MF	20%	25V
C314	1-123-330-00	ELECT	22MF	20%	25V
C315	1-123-330-00	ELECT	22MF	20%	25V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C316	1-123-330-00	ELECT	22MF	20%	25V
C317	1-123-380-00	ELECT	1MF	20%	50V
C318	1-123-330-00	ELECT	22MF	20%	25V
C319	1-162-282-31	CERAMIC	100PF	10%	50V
C320	1-162-596-00	CERAMIC	0.022MF		25V
C321	1-162-203-31	CERAMIC	15PF	5%	50V
C322	1-162-195-31	CERAMIC	4.7PF	10%	50V
C323	1-162-294-31	CERAMIC	0.001MF	10%	50V
C324	1-162-596-00	CERAMIC	0.022MF		25V
C325	1-162-294-31	CERAMIC	0.001MF	10%	50V
C326	1-162-596-00	CERAMIC	0.022MF		25V
C331	1-162-596-00	CERAMIC	0.022MF		25V
C332	1-123-330-00	ELECT	22MF	20%	25V
C333	1-123-330-00	ELECT	22MF	20%	25V
C335	1-162-294-31	CERAMIC	0.001MF	10%	50V
C336	1-162-282-31	CERAMIC	100PF	10%	50V
C337	1-123-330-00	ELECT	22MF	20%	25V
C339	1-123-330-00	ELECT	22MF	20%	25V
C340	1-123-330-00	ELECT	22MF	20%	25V
C341	1-123-330-00	ELECT	22MF	20%	25V
C342	1-123-330-00	ELECT	22MF	20%	25V
C344	1-123-330-00	ELECT	22MF	20%	25V
C345	1-123-330-00	ELECT	22MF	20%	25V
C346	1-123-330-00	ELECT	22MF	20%	25V
C347	1-123-330-00	ELECT	22MF	20%	25V
C348	1-123-330-00	ELECT	22MF	20%	25V
C349	1-123-330-00	ELECT	22MF	20%	25V
C350	1-123-330-00	ELECT	22MF	20%	25V
C351	1-123-308-00	ELECT	220MF	20%	10V
C401	1-162-211-31	CERAMIC	33PF	5%	50V
C402	1-162-211-31	CERAMIC	33PF	5%	50V
C403	1-162-596-00	CERAMIC	0.022MF		25V
C404	1-162-596-00	CERAMIC	0.022MF		25V
C405	1-124-468-11	ELECT	100MF	20%	6.3V
C406	1-124-468-11	ELECT	100MF	20%	6.3V
C407	1-162-596-00	CERAMIC	0.022MF		25V
C408	1-162-561-11	CERAMIC	0.1MF		16V
C409	1-162-561-11	CERAMIC	0.1MF		16V
C410	1-162-561-11	CERAMIC	0.1MF		16V
C411	1-162-561-11	CERAMIC	0.1MF		16V
C412	1-162-561-11	CERAMIC	0.1MF		16V
C413	1-162-596-00	CERAMIC	0.022MF		25V
C414	1-162-596-00	CERAMIC	0.022MF		25V
C415	1-162-561-11	CERAMIC	0.1MF		16V
C416	1-124-468-11	ELECT	100MF	20%	6.3V
C417	1-162-596-00	CERAMIC	0.022MF		25V
C418	1-162-596-00	CERAMIC	0.022MF		25V
C419	1-162-596-00	CERAMIC	0.022MF		25V
C420	1-162-596-00	CERAMIC	0.022MF		25V
C421	1-162-596-00	CERAMIC	0.022MF		25V
C422	1-124-903-00	ELECT	1MF	20%	50V
C423	1-124-907-00	ELECT	10MF	20%	50V
C424	1-162-596-00	CERAMIC	0.022MF		25V
C425	1-162-596-00	CERAMIC	0.022MF		25V
C426	1-124-468-11	ELECT	100MF	20%	6.3V
C427	1-162-596-00	CERAMIC	0.022MF		25V
C428	1-162-561-11	CERAMIC	0.1MF		16V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C429	1-124-481-11	ELECT	22MF	20%	25V
C430	1-162-596-00	CERAMIC	0.022MF		25V
C501	1-123-645-00	ELECT	33MF	20%	10V
C502	1-123-612-00	ELECT	2.2MF	20%	50V
C503	1-123-613-00	ELECT	3.3MF	20%	50V
C504	1-162-596-00	CERAMIC	0.022MF		25V
C901	1-124-563-11	ELECT	2200MF	20%	25V
C902	1-124-563-11	ELECT	2200MF	20%	25V
C903	1-124-557-11	ELECT	1000MF	20%	25V
C905	1-123-321-00	ELECT	220MF	20%	16V
C906	1-123-321-00	ELECT	220MF	20%	16V
C907	1-124-897-11	ELECT	3300MF	20%	16V
C908	1-124-897-11	ELECT	3300MF	20%	16V
C909	1-124-897-11	ELECT	3300MF	20%	16V
C910	1-123-343-00	ELECT	33MF	20%	25V
C911	1-124-481-11	ELECT	22MF	20%	25V
C912	1-124-473-11	ELECT	1000MF	20%	10V
C913	1-136-165-00	FILM	0.1MF	5%	50V
C914	1-124-900-51	ELECT	470MF	20%	35V
C915	1-124-911-51	ELECT	220MF	20%	50V
C916	1-124-907-00	ELECT	10MF	20%	50V
C917	1-124-910-91	ELECT	47MF	20%	50V
C918	1-124-927-11	ELECT	4.7MF	20%	50V
C919	1-162-596-00	CERAMIC	0.022MF		25V
C920	1-162-596-00	CERAMIC	0.022MF		25V
C921	1-162-596-00	CERAMIC	0.022MF		25V
C922	1-162-596-00	CERAMIC	0.022MF		25V
CNJ101	1-507-908-11	JACK, PIN 4P			
CNJ102	1-507-908-11	JACK, PIN 4P			
CNJ201	1-507-908-11	JACK, PIN 4P			
CNJ202	1-507-908-11	JACK, PIN 4P			
CNP1	*1-560-339-00	PIN, CONNECTOR 9P			
CNP2	*1-564-339-00	PIN, CONNECTOR 5P			
CNP3	*1-564-495-11	PIN, CONNECTOR 2P			
CNP4	*1-564-341-11	PIN, CONNECTOR 7P			
CNP5	*1-564-341-11	PIN, CONNECTOR 7P			
CNP6	*1-564-342-11	PIN, CONNECTOR 8P			
CP101	1-807-492-11	DIODE (LED BLOCK)			
CP201	1-807-492-11	DIODE (LED BLOCK)			
CP501	1-232-154-00	COMPOSITION CIRCUIT BLOCK			
D101	8-719-933-54	DIODE HZS9A2L			
D102	8-719-940-76	DIODE 1SS132			
D103	8-719-933-38	DIODE HZS6B3L			
D201	8-719-933-53	DIODE HZS9A2L			
D202	8-719-940-76	DIODE 1SS132			
D203	8-719-933-38	DIODE HZS6B3L			
D301	8-719-933-39	DIODE HZS6C1L			
D302	8-719-933-39	DIODE HZS6C1L			
D304	8-719-940-76	DIODE 1SS132			
D306	8-719-940-76	DIODE 1SS132			
D307	8-719-940-76	DIODE 1SS132			
D308	8-719-940-76	DIODE 1SS132			
D309	8-719-802-08	DIODE TLR208			
D401	8-719-940-76	DIODE 1SS132			
D402	8-719-940-76	DIODE 1SS132			
D403	8-719-940-76	DIODE 1SS132			

ELECTRICAL PARTS

Ref.No.	Part No.	Description
D404	8-719-940-76	DIODE 1SS132
D405	8-719-940-76	DIODE 1SS132
D406	8-719-940-76	DIODE 1SS132
D407	8-719-940-76	DIODE 1SS132
D408	8-719-940-76	DIODE 1SS132
D409	8-719-940-76	DIODE 1SS132
D410	8-719-940-76	DIODE 1SS132
D411	8-719-940-76	DIODE 1SS132
D412	8-719-940-76	DIODE 1SS132
D413	8-719-940-76	DIODE 1SS132
D414	8-719-946-76	DIODE 1SS132
D501	8-719-301-38	DIODE SEL2210S-C
D502	8-719-301-38	DIODE SEL2210S-C
D503	8-719-301-38	DIODE SEL2210S-C
D504	8-719-301-38	DIODE SEL2210S-C
D505	8-719-301-38	DIODE SEL2210S-C
D506	8-719-301-38	DIODE SEL2210S-C
D507	8-719-301-38	DIODE SEL2210S-C
D508	8-719-301-38	DIODE SEL2210S-C
D509	8-719-301-38	DIODE SEL2210S-C
D510	8-719-301-38	DIODE SEL2210S-C
D511	8-719-301-38	DIODE SEL2210S-C
D512	8-719-301-38	DIODE SEL2210S-C
D513	8-719-301-38	DIODE SEL2210S-C
D514	8-719-301-38	DIODE SEL2210S-C
D515	8-719-301-38	DIODE SEL2210S-C
D516	8-719-301-38	DIODE SEL2210S-C
D517	8-719-301-38	DIODE SEL2210S-C
D518	8-719-301-38	DIODE SEL2210S-C
D519	8-719-301-38	DIODE SEL2210S-C
D520	8-719-301-38	DIODE SEL2210S-C
D521	8-719-110-13	DIODE RD9.1ES-B2
D522	8-719-940-76	DIODE 1SS132
D523	8-719-940-76	DIODE 1SS132
D524	8-719-940-76	DIODE 1SS132
D525	8-719-940-76	DIODE 1SS132
D526	8-719-940-76	DIODE 1SS132
D527	8-719-940-76	DIODE 1SS132
D528	8-719-940-76	DIODE 1SS132
D529	8-719-940-76	DIODE 1SS132
D530	8-719-940-76	DIODE 1SS132
D531	8-719-940-76	DIODE 1SS132
D532	8-719-812-43	DIODE 1SSTLG124A
D901	8-719-210-12	DIODE 10DF2
D902	8-719-210-12	DIODE 10DF2
D903	8-719-210-12	DIODE 10DF2
D904	8-719-210-12	DIODE 10DF2
D905	8-719-200-77	DIODE 10E2N
D906	8-719-200-77	DIODE 10E2N
D907	8-719-210-12	DIODE 10DF2
D908	8-719-210-12	DIODE 10DF2
D909	8-719-210-12	DIODE 10DF2
D910	8-719-210-12	DIODE 10DF2
D911	8-719-200-77	DIODE 10E2N
D912	8-719-200-77	DIODE 10E2N
D913	8-719-934-15	DIODE HZS24-3L
D914	8-719-933-48	DIODE HZS7B3L
D915	8-719-940-76	DIODE 1SS132

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

ELECTRICAL PARTS

Ref.No.	Part No.	Description
F1-F4	⚠ 1-532-215-11	(AEP,E)...FUSE, TIME-LAG 0.8A 250V
F1-F4	⚠ 1-532-739-11	(US,CANADIAN)..FUSE, GLASS TUBE 0.8A 125V
FLD501	1-519-397-11	INDICATOR TUBE, FLUORESCENT
IC101	8-759-745-60	IC NJM4560D
IC102	8-759-910-75	IC LF353DP
IC103	8-759-910-75	IC LF353DP
IC104	8-759-910-75	IC LF353DP
IC105	8-759-909-98	IC CX-7976
IC106	8-759-700-40	IC NJM4560S
IC107	8-759-700-40	IC NJM4560S
IC108	8-759-912-79	IC IR2E02
IC201	8-759-745-60	IC NJM4560D
IC202	8-759-910-75	IC LF353DP
IC203	8-759-910-75	IC LF353DP
IC204	8-759-910-75	IC LF353DP
IC205	8-759-909-98	IC CX-7976
IC206	8-759-700-40	IC NJM4560S
IC207	8-759-700-40	IC NJM4560S
IC208	8-759-912-79	IC IR2E02
IC301	8-759-701-65	IC NJM79M05A
IC302	8-759-701-56	IC NJM78M05A
IC303	8-759-701-65	IC NJM79M05A
IC304	8-759-745-60	IC NJM4560D
IC305	8-752-001-80	IC CX20018
IC306	8-752-001-70	IC CX20017
IC307	8-759-202-13	IC TC74HCU04P
IC308	8-759-140-53	IC UPD4053BC
IC309	8-759-708-05	IC NJM78L05A
IC310	8-759-745-60	IC NJM4560D
IC401	8-759-927-77	IC CXD1079Q
IC402	8-759-929-47	IC MB81464-10
IC403	8-759-929-47	IC MB81464-10
IC404	8-759-929-47	IC MB81464-10
IC405	8-759-929-47	IC MB81464-10
IC406	8-759-303-78	IC HD363B03XP
IC407	8-759-112-73	IC UPD27C256C-MUR201
IC408	8-759-102-95	IC UPD4464C-15
IC409	8-759-303-74	IC HD63B50P
IC410	8-759-000-99	IC MC74HC74C
IC411	8-759-001-00	IC MC74HC132N
IC412	8-759-202-74	IC TC74HC04P
IC413	8-759-916-15	IC SN74HC05N
IC501	8-759-108-75	IC UPD7528C-036
IC901	8-759-170-12	IC UPC78M12H
IC902	8-759-701-56	IC NJM78M05A
IC903	8-759-701-56	IC NJM78M05A
J101	1-563-363-11	JACK, LARGE TYPE 2P
J102	1-563-363-11	JACK, LARGE TYPE 2P
J201	1-563-363-11	JACK, LARGE TYPE 2P
J202	1-563-363-11	JACK, LARGE TYPE 2P
J401	1-563-363-11	JACK, LARGE TYPE 2P
J402	1-563-363-11	JACK, LARGE TYPE 2P
J403	1-563-169-11	CONNECTOR, DIN 5P
J404	1-563-169-11	CONNECTOR, DIN 5P
J405	1-563-369-11	CONNECTOR, DIN 6P
L301	1-408-902-21	MICRO INDUCTOR 0.47UH
LF1	⚠ 1-421-340-00	LINE FILTER

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
LPF101	1-464-664-11	FILTER UNIT, LOW PASS			
LPF102	1-464-664-11	FILTER UNIT, LOW PASS			
LPF201	1-464-664-11	FILTER UNIT, LOW PASS			
LPF202	1-464-664-11	FILTER UNIT, LOW PASS			
PH401	8-719-938-71	PC900			
Q101	8-769-162-00	TRANSISTOR 2SK152			
Q102	8-769-162-00	TRANSISTOR 2SK152			
Q103	8-729-107-98	TRANSISTOR 2SC3622A-L			
Q201	8-769-162-00	TRANSISTOR 2SK152			
Q202	8-769-162-00	TRANSISTOR 2SK152			
Q203	8-729-107-98	TRANSISTOR 2SC3622A-L			
Q301	8-729-180-92	TRANSISTOR 2SD809-K			
Q302	8-729-315-22	TRANSISTOR 2SD1152			
Q303	8-729-315-22	TRANSISTOR 2SD1152			
Q304	8-729-203-03	TRANSISTOR 2SK30A-Y			
Q305	8-729-173-13	TRANSISTOR 2SB731			
Q306	8-729-384-48	TRANSISTOR 2SA844			
Q307	8-729-384-48	TRANSISTOR 2SA844			
Q308	8-729-203-03	TRANSISTOR 2SK30A-Y			
Q401	8-729-900-61	TRANSISTOR DTA114ES			
Q402	8-729-900-89	TRANSISTOR DTC144ES			
Q403	8-729-900-80	TRANSISTOR DTC114ES			
Q404	8-729-117-54	TRANSISTOR 2SA1175			
Q501	8-729-900-80	TRANSISTOR DTC114ES			
Q502	8-729-900-80	TRANSISTOR DTC114ES			
Q503	8-729-900-80	TRANSISTOR DTC114ES			
Q504	8-729-900-80	TRANSISTOR DTC114ES			
Q505	8-729-900-80	TRANSISTOR DTC114ES			
Q506	8-729-900-80	TRANSISTOR DTC114ES			
Q507	8-729-900-80	TRANSISTOR DTC114ES			
Q508	8-729-900-80	TRANSISTOR DTC114ES			
Q509	8-729-900-89	TRANSISTOR DTC144ES			
Q510	8-729-900-89	TRANSISTOR DTC144ES			
Q511	8-729-900-89	TRANSISTOR DTC144ES			
Q512	8-729-900-61	TRANSISTOR DTA114ES			
Q513	8-729-900-61	TRANSISTOR DTA114ES			
Q514	8-729-900-61	TRANSISTOR DTA114ES			
Q901	8-729-802-22	TRANSISTOR 2SB1014			
Q902	8-729-600-27	TRANSISTOR 2SC634SP			
Q903	8-729-600-27	TRANSISTOR 2SC634SP			
Q904	8-729-600-27	TRANSISTOR 2SC634SP			
Q905	8-729-900-89	TRANSISTOR DTC144ES			
Q906	8-729-900-89	TRANSISTOR DTC144ES			
Q907	8-729-117-54	TRANSISTOR 2SA1175			
R101	1-249-947-11	CARBON	10K	1%	1/4W
R102	1-249-915-11	CARBON	470	1%	1/4W
R103	1-249-608-91	CARBON	220K		1/4W
R104	1-249-608-91	CARBON	220K		1/4W
R105	1-247-704-11	CARBON	220		1/4W
R106	1-249-930-91	CARBON	2K	1%	1/4W
R107	1-249-919-11	CARBON	680	1%	1/4W
R108	1-249-944-91	CARBON	7.5K	1%	1/4W
R109	1-249-469-11	CARBON	100K		1/4W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R110	1-247-717-11	CARBON	2.2K	1%	1/4W
R111	1-249-941-91	CARBON	5.6K	1%	1/4W
R112	1-249-947-11	CARBON	10K	1%	1/4W
R113	1-249-589-11	CARBON	36K		1/4W
R114	1-249-429-11	CARBON	10K		1/6W
R115	1-249-947-11	CARBON	10K	1%	1/4W
R116	1-249-919-11	CARBON	680	1%	1/4W
R117	1-249-556-11	CARBON	1.5K		1/4W
R118	1-247-163-00	CARBON	22K		1/4W
R119	1-247-708-11	CARBON	470		1/4W
R120	1-247-713-11	CARBON	1K		1/4W
R121	1-247-163-00	CARBON	22K		1/4W
R122	1-247-717-11	CARBON	2.2K		1/4W
R123	1-247-145-00	CARBON	3.9K		1/4W
R124	1-249-429-11	CARBON	10K	5%	1/6W
R131	1-249-425-11	CARBON	4.7K	5%	1/6W
R132	1-249-421-11	CARBON	2.2K	5%	1/6W
R133	1-249-951-11	CARBON	15K	1%	1/4W
R134	1-247-193-00	CARBON	22K	1%	1/4W
R135	1-247-725-11	CARBON	10K		1/4W
R136	1-249-951-11	CARBON	15K	1%	1/4W
R137	1-247-725-11	CARBON	10K		1/4W
R138	1-249-949-91	CARBON	12K	1%	1/4W
R139	1-247-704-11	CARBON	220		1/4W
R140	1-249-949-91	CARBON	12K	1%	1/4W
R141	1-249-429-11	CARBON	10K	5%	1/6W
R142	1-247-845-00	CARBON	3.9K	5%	1/6W
R143	1-247-895-00	CARBON	470K	5%	1/6W
R144	1-249-434-11	CARBON	27K	5%	1/6W
R145	1-247-838-00	CARBON	2K	5%	1/6W
R146	1-247-895-00	CARBON	470K	5%	1/6W
R147	1-249-434-11	CARBON	27K	5%	1/6W
R148	1-247-837-00	CARBON	1.8K	5%	1/6W
R149	1-247-895-00	CARBON	470K	5%	1/6W
R150	1-249-434-11	CARBON	27K	5%	1/6W
R151	1-249-419-11	CARBON	1.5K	5%	1/6W
R152	1-247-895-00	CARBON	470K	5%	1/6W
R153	1-249-434-11	CARBON	27K	5%	1/6W
R154	1-247-836-00	CARBON	1.6K	5%	1/6W
R155	1-247-163-00	CARBON	22K		1/4W
R156	1-247-163-00	CARBON	22K		1/4W
R157	1-249-469-11	CARBON	100K		1/4W
R158	1-249-918-91	CARBON	620	1%	1/4W
R159	1-249-941-91	CARBON	5.6K	1%	1/4W
R160	1-249-949-91	CARBON	12K	1%	1/4W
R161	1-249-946-91	CARBON	9.1K	1%	1/4W
R162	1-249-918-91	CARBON	620	1%	1/4W
R163	1-247-125-00	CARBON	560		1/4W
R164	1-247-857-00	CARBON	12K	5%	1/6W
R165	1-249-941-91	CARBON	5.6K	1%	1/4W
R166	1-249-947-11	CARBON	10K	1%	1/4W
R171	1-249-435-11	CARBON	33K	5%	1/6W
R172	1-247-858-00	CARBON	13K	5%	1/6W
R173	1-249-441-11	CARBON	100K	5%	1/6W
R174	1-249-441-11	CARBON	3.3K	5%	1/6W
R175	1-249-429-11	CARBON	10K	5%	1/6W
R176	1-249-429-11	CARBON	10K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R201	1-249-947-11	CARBON	10K	1%	1/4W
R202	1-249-915-11	CARBON	470	1%	1/4W
R203	1-249-608-91	CARBON	220K		1/4W
R204	1-249-608-91	CARBON	220K		1/4W
R205	1-247-704-11	CARBON	220		1/4W
R206	1-249-930-91	CARBON	2K	1%	1/4W
R207	1-249-919-11	CARBON	680	1%	1/4W
R208	1-249-944-91	CARBON	7.5K	1%	1/4W
R209	1-249-469-11	CARBON	100K		1/4W
R210	1-247-717-11	CARBON	2.2K	1%	1/4W
R211	1-249-941-91	CARBON	5.6K	1%	1/4W
R212	1-249-947-11	CARBON	10K	1%	1/4W
R213	1-249-589-11	CARBON	36K		1/4W
R214	1-249-429-11	CARBON	10K		1/6W
R215	1-249-947-11	CARBON	10K	1%	1/4W
R216	1-249-919-11	CARBON	680	1%	1/4W
R217	1-249-556-11	CARBON	1.5K		1/4W
R218	1-247-163-00	CARBON	22K		1/4W
R219	1-247-708-11	CARBON	470		1/4W
R220	1-247-713-11	CARBON	1K		1/4W
R221	1-247-163-00	CARBON	22K		1/4W
R222	1-247-717-11	CARBON	2.2K		1/4W
R223	1-247-145-00	CARBON	3.9K		1/4W
R224	1-249-429-11	CARBON	10K	5%	1/6W
R231	1-249-425-11	CARBON	4.7K	5%	1/6W
R232	1-249-421-11	CARBON	2.2K	5%	1/6W
R233	1-249-951-11	CARBON	15K	1%	1/4W
R234	1-247-193-00	CARBON	22K	1%	1/4W
R235	1-247-725-11	CARBON	10K		1/4W
R236	1-249-951-11	CARBON	15K	1%	1/4W
R237	1-247-725-11	CARBON	10K		1/4W
R238	1-249-949-91	CARBON	12K	1%	1/4W
R239	1-247-704-11	CARBON	220		1/4W
R240	1-249-949-91	CARBON	12K	1%	1/4W
R241	1-249-429-11	CARBON	10K	5%	1/6W
R242	1-247-845-00	CARBON	3.9K	5%	1/6W
R243	1-247-895-00	CARBON	470K	5%	1/6W
R244	1-249-434-11	CARBON	27K	5%	1/6W
R245	1-247-838-00	CARBON	2K	5%	1/6W
R246	1-247-895-00	CARBON	470K	5%	1/6W
R248	1-247-837-00	CARBON	1.8K	5%	1/6W
R249	1-247-895-00	CARBON	470K	5%	1/6W
R251	1-249-419-11	CARBON	1.5K	5%	1/6W
R252	1-247-895-00	CARBON	470K	5%	1/6W
R254	1-247-836-00	CARBON	1.6K	5%	1/6W
R255	1-247-163-00	CARBON	22K		1/4W
R256	1-247-163-00	CARBON	22K		1/4W
R257	1-249-469-11	CARBON	100K		1/4W
R258	1-249-918-91	CARBON	620	1%	1/4W
R259	1-249-941-91	CARBON	5.6K	1%	1/4W
R260	1-249-949-91	CARBON	12K	1%	1/4W
R261	1-249-946-91	CARBON	9.1K	1%	1/4W
R262	1-249-918-91	CARBON	620	1%	1/4W
R263	1-247-125-00	CARBON	560		1/4W
R264	1-247-857-00	CARBON	12K	5%	1/6W
R265	1-249-941-91	CARBON	5.6K	1%	1/4W
R266	1-249-947-11	CARBON	10K	1%	1/4W
R271	1-249-435-11	CARBON	33K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R272	1-247-858-00	CARBON	13K	5%	1/6W
R273	1-249-441-11	CARBON	100K	5%	1/6W
R274	1-249-441-11	CARBON	100K	5%	1/6W
R275	1-249-429-11	CARBON	10K	5%	1/6W
R276	1-249-429-11	CARBON	10K	5%	1/6W
R301	1-249-812-91	CARBON	2.7K	1%	1/2W
R302	1-249-814-91	CARBON	3.3K	1%	1/2W
R303	1-249-814-91	CARBON	3.3K	1%	1/2W
R304	1-249-812-91	CARBON	2.7K	1%	1/2W
R305	1-247-725-11	CARBON	10K		1/4W
R306	1-247-725-11	CARBON	10K		1/4W
R307	1-247-946-91	CARBON	9.1K		1/4W
R308	1-249-437-11	CARBON	47K	1%	1/4W
R309	1-249-425-11	CARBON	4.7K	5%	1/6W
R310	1-249-417-11	CARBON	1K	5%	1/6W
R311	1-249-422-11	CARBON	2.7K	5%	1/6W
R312	1-249-425-11	CARBON	4.7K	5%	1/6W
R313	1-247-951-11	CARBON	15K		1/4W
R314	1-249-969-91	CARBON	82K	1%	1/4W
R315	1-249-419-11	CARBON	1.5K	5%	1/6W
R316	1-249-437-11	CARBON	47K	5%	1/6W
R317	1-249-417-11	CARBON	1K	5%	1/6W
R318	1-249-417-11	CARBON	1K	5%	1/6W
R319	1-249-441-11	CARBON	100K	5%	1/6W
R401	1-249-405-11	CARBON	100	5%	1/6W
R402	1-249-405-11	CARBON	100	5%	1/6W
R403	1-249-405-11	CARBON	100	5%	1/6W
R404	1-249-405-11	CARBON	100	5%	1/6W
R405	1-249-441-11	CARBON	100K	5%	1/6W
R406	1-249-441-11	CARBON	100K	5%	1/6W
R407	1-249-441-11	CARBON	100K	5%	1/6W
R408	1-249-441-11	CARBON	100K	5%	1/6W
R413	1-249-441-11	CARBON	100K	5%	1/6W
R414	1-249-435-11	CARBON	33K	5%	1/6W
R415	1-247-891-00	CARBON	330K	5%	1/6W
R416	1-249-405-11	CARBON	100	5%	1/6W
R417	1-249-417-11	CARBON	1K	5%	1/6W
R418	1-249-429-11	CARBON	10K	5%	1/6W
R419	1-249-429-11	CARBON	10K	5%	1/6W
R420	1-249-429-11	CARBON	10K	5%	1/6W
R421	1-249-429-11	CARBON	10K	5%	1/6W
R422	1-249-429-11	CARBON	10K	5%	1/6W
R423	1-249-417-11	CARBON	1K	5%	1/6W
R424	1-249-417-11	CARBON	1K	5%	1/6W
R425	1-249-417-11	CARBON	1K	5%	1/6W
R426	1-249-433-11	CARBON	22K	5%	1/6W
R427	1-249-433-11	CARBON	22K	5%	1/6W
R428	1-249-433-11	CARBON	22K	5%	1/6W
R429	1-249-433-11	CARBON	22K	5%	1/6W
R430	1-249-433-11	CARBON	22K	5%	1/6W
R431	1-249-433-11	CARBON	22K	5%	1/6W
R432	1-249-425-11	CARBON	4.7K	5%	1/6W
R433	1-249-429-11	CARBON	10K	5%	1/6W
R434	1-247-815-00	CARBON	220	5%	1/6W
R435	1-247-815-00	CARBON	220	5%	1/6W
R436	1-247-815-00	CARBON	220	5%	1/6W
R437	1-247-815-00	CARBON	220	5%	1/6W
R438	1-249-421-11	CARBON	2.2K	5%	1/6W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R439	1-249-429-11	CARBON	10K	5%	1/6W
R440	1-249-441-11	CARBON	100K	5%	1/6W
R441	1-249-441-11	CARBON	100K	5%	1/6W
R442	1-247-815-00	CARBON	220	5%	1/6W
R443	1-247-815-00	CARBON	220	5%	1/6W
R444	1-249-421-11	CARBON	2.2K	5%	1/6W
R501	1-247-875-00	CARBON	68K	5%	1/6W
R502	1-249-429-11	CARBON	10K	5%	1/6W
R503	1-249-417-11	CARBON	1K	5%	1/6W
R504	1-249-417-11	CARBON	1K	5%	1/6W
R505	1-249-405-11	CARBON	100	5%	1/6W
R506	1-249-405-11	CARBON	100	5%	1/6W
R507	1-249-417-11	CARBON	1K	5%	1/6W
R509	1-249-429-11	CARBON	10K	5%	1/6W
R510	1-249-429-11	CARBON	10K	5%	1/6W
R511	1-249-405-11	CARBON	100	5%	1/6W
R512	1-249-405-11	CARBON	100	5%	1/6W
R513	1-249-405-11	CARBON	100	5%	1/6W
R901	1-247-118-00	CARBON	300	5%	1/4W
R902	1-247-811-00	CARBON	150	5%	1/6W
R903	1-247-885-00	CARBON	180K	5%	1/6W
R904	1-249-437-11	CARBON	47K	5%	1/6W
R905	1-249-437-11	CARBON	47K	5%	1/6W
R906	1-249-423-11	CARBON	22K	5%	1/6W
R907	1-249-433-11	CARBON	22K	5%	1/6W
R908	1-249-421-11	CARBON	2.2K	5%	1/6W
R909	1-247-823-00	CARBON	470	5%	1/6W
R911	1-247-843-00	CARBON	3.3K	5%	1/6W
R912	1-249-433-11	CARBON	22K	5%	1/6W
R913	1-249-433-11	CARBON	22K	5%	1/6W
R914	1-249-437-11	CARBON	47K	5%	1/6W
RV101	1-237-292-11	RES, VAR, CARBON 20K/20K (INPUT CH1)			
RV102	1-224-252-XX	RES, ADJ, METAL GLAZE 10K (OFFSET)			
RV103	1-230-702-00	RES, ADJ, METAL GLAZE 2.2K (DIST)			
RV104	1-237-306-11	RES, VAR, CARBON 10K/10K (DRY)			
RV105	1-237-306-11	RES, VAR, CARBON 10K/10K (EFECT)			
RV106	1-230-630-11	RES, ADJ, CARBON 10K (METER)			
RV201	1-237-292-11	RES, VAR, CARBON 20K/20K (INPUT CH2)			
RV202	1-224-252-XX	RES, ADJ, METAL GLAZE 10K (OFFSET)			
RV203	1-230-702-00	RES, ADJ, METAL GLAZE 2.2K (DIST)			
RV204	1-237-306-11	RES, VAR, CARBON 10K/10K (DRY)			
RV205	1-237-306-11	RES, VAR, CARBON 10K/10K (EFECT)			
RV206	1-228-994-00	RES, ADJ, CARBON 10K (METER)			
RY301	1-515-519-00	RELAY			
RY302	1-515-519-00	RELAY			
RY303	1-515-519-00	RELAY			

ELECTRICAL PARTS

Ref.No.	Part No.	Description
S1	⚠.1-553-318-00	SWITCH, PUSH (AC POWER)(1 KEY)
S2	⚠.1-526-576-51	(E)...SELECTOR, POWER VOLTAGE
S3	1-552-571-00	SWITCH, PUSH (BYPASS)
S4	1-553-963-00	SWITCH, PUSH (1 KEY)(LEVEL)
S501	1-570-876-11	SWITCH, KEYBOARD (-)
S502	1-570-876-11	SWITCH, KEYBOARD (+)
S503	1-570-876-11	SWITCH, KEYBOARD (PRESET MEMORY)
S504	1-570-876-11	SWITCH, KEYBOARD (USER MEMORY)
S505	1-570-876-11	SIWTCH, KEYBOARD (WRITE)
S506	1-570-876-11	SWITCH, KEYBOARD (EDIT)
S507	1-570-876-11	SWITCH, KEYBOARD (EQ)
S508	1-570-876-11	SWITCH, KEYBOARD (MIDI)
S509	1-570-876-11	SWITCH, KEYBOARD (REV T/LOW)(0)
S510	1-570-876-11	SWITCH, KEYBOARD (E RFL T/L MID)(1)
S511	1-570-876-11	SWITCH, KEYBOARD (RT HIGH/H MID)(2)
S512	1-570-876-11	SWITCH, KEYBOARD (SPREAD/HIGH)(3)
S513	1-570-876-11	SWITCH, KEYBOARD (FBL/EFF L)(4)
S514	1-570-876-11	SWITCH, KEYBOARD (DEPTH/FLAT)
S515	1-570-876-11	SWITCH, KEYBOARD (CH EDIT)(STEREO)
S516	1-570-876-11	SWITCH, KEYBOARD (PRE TD/PGM NO)(5)
S517	1-570-876-11	SWITCH, KEYBOARD (E RFL L/MEMO NO)(6)
S518	1-570-876-11	SWITCH, KEYBOARD (PHASE/MIDI CH)(7)
S519	1-570-876-11	SWITCH, KEYBOARD (GATE T/CTL NO)(8)
S520	1-570-876-11	SWITCH, KEYBOARD (REPEAT)(9)
S521	1-570-876-11	SWITCH, KEYBOARD (SPEED/CASCADE)
S522	1-570-876-11	SWITCH, KEYBOARD (CH SYNC)(MONO)
T1	⚠.1-448-592-11	(E)..........TRANSFORMER, POWER
T1	⚠.1-448-593-11	(US,CANADIAN).TRANSFORMER, POWER
X301	1-567-709-11	OSCILLATOR, CRYSTAL
X401	1-567-132-00	VIBLATOR, CERAMIC

ACCESSORY & PACKING MATERIAL

Part No.	Description
3-701-630-00	BAG, POLYETHYLENE
3-765-818-11	(US,CA,AEP,E2,E3)...MANUAL, INSTRUCTION (ENGLISH)
3-765-818-41	(AEP)...MANUAL, INSTRUCTION (GERMAN)
3-765-818-51	(AEP)...MANUAL, INSTRUCTION (SPANISH)
4-916-325-01	SHEET, PROTECTION
4-916-326-01	INDIVIDUAL CARTON
4-916-328-01	CUSHION (RIGHT)
4-916-329-01	CUSHION (LEFT)

- ※ : selected to yield optimum performance.

The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une trame et une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

TROUBLESHOOTING

Check the following points before requesting service.

Symptom	Check
No power.	• Power cord not properly plugged into outlet.
No sound.	• INPUT control set to "0". • DRY and EFFECT controls set to "0".
No effects.	• EFFECT control set to "0". • BYPASS switch is depressed.
Low output volume	• Connected to audio amplifier, but LEVEL switch is set to +4 dB.
Sound is distorted.	• Connected to a professional equipment, but LEVEL switch is set to – 20 dB.
No stereo effect.	• Input is a monaural signal.
Parameter buttons do not work.	• EDIT indicator flashes. • EQ button indicator flashes. • FLAT button indicator flashes.
MIDI control not possible.	• MIDI reception channel of MU-R201 and transmission channel of other equipment are not matched. • Control numbers do not match.

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